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DEEP OPERATIONS COORDINATION CELL (DOCC) ANALYSIS

FINAL REPORT

TRADOC Analysis Center
Study and Analysis Center
Study Directorate
Fort Leavenworth, Kansas 66027-5200

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FINAL REPORT

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The DOCC analysis was conducted at the request of the Depth and Simultaneous Attack Battlefield Laboratory (D&SA BL) to support the need/benefit of a proposed deep operations coordination cell (DOCC). With advances in U.S. military target acquisition capabilities and weapon delivery systems, there exists a critical requirement to improve the planning and execution of deep operations command and control (C2) procedures. Centralization of deep operations procedures into a single corps staff element and automating many of the time-consuming tasks seemed to be a way to improve deep operations. Midway through the study, it was learned that selected corps commanders have established deep operations cells under the supervision of their corps artillery commanders. V Corps is developing the Automated Deep Operations Coordination System (ADOCS) to provide horizontal integration of target processing. The results of this study confirmed that centralization of deep operations C2 procedures in the corps fire support cell, along with automation support of ADOCS, does improve C2 processing of deep operations.

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The authors acknowledge the outstanding contributions by the members of the fire support cell of the V Corps Artillery for providing field standing operating procedures (SOP), documentation of their evolving Automated Deep Operations Coordination System (ADOCS), and their patience in hosting us during the July 1994 CARAVAN GUARD command post exercise to observe their deep operations command and control C2 procedures.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES (continued)

LIST OF TABLES

ABSTRACT

The Deep Operations Coordination Cell (DOCC) analysis study was conducted by the Study and Analysis Center (SAC) of the U.S. Army Training and Doctrine Command's (TRADOC) Analysis Center (TRAC). This document is the final report for the DOCC analysis.

The DOCC analysis was conducted at the request of the Depth and Simultaneous Attack Battlefield Laboratory (D&SA BL) to support the need/benefit of a proposed deep operations coordination cell (DOCC). With advances in U.S. military target acquisition capabilities and weapon delivery systems, there exists a critical requirement to improve the planning and execution of deep operations command and control (C2) procedures. Centralization of deep operations procedures into a single corps staff element and automating many of the time-consuming tasks seemed to be a way to improve deep operations. Midway through the study, it was learned that selected corps commanders have established deep operations cells under the supervision of their corps artillery commanders. V Corps is developing the Automated Deep Operations Coordination System (ADOCS) to provide horizontal integration of target processing. The results of this study confirmed that centralization of deep operations C2 procedures in the corps fire support cell, along with automation support of ADOCS, does improve C2 processing of deep operations.

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EXECUTIVE SUMMARY
DEEP OPERATIONS COORDINATION CELL (DOCC) ANALYSIS

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1. Purpose. The purposes of the Deep Operations Coordination Cell (DOCC) analysis were to identify deep operations command and control (C2) procedures and to evaluate various DOCC configurations to identify improvements to deep operations C2 procedures. The configurations varied by where deep operations tasks were performed, the sequence of task performance and whether selected tasks were performed in series or parallel, and which tasks could be automated to gain efficiencies in the network.

2. Introduction.

a. Background. In August 1993, the Depth and Simultaneous Attack Battlefield Laboratory (D&SA BL) requested the U.S. Army Training and Doctrine Command's (TRADOC) Analysis Center (TRAC) support in developing a DOCC within the corps headquarters. Lessons learned in recent combat operations indicate a need to improve the planning and execution of deep operations C2 procedures. Developing doctrine recommends that the responsibility for deep operations planning, and the authority for execution, be centralized under one staff section to ensure a continuous focus. Additionally, advances in commercial technology that are applicable to military C2 procedures show the potential to reduce the time necessary to perform the mechanics of deep operations planning and execution. Corps commanders have taken the initiative to establish DOCCs within their command posts (CP) under the supervision of their corps artillery commanders.

b. Objectives.

(1) Research and identify doctrinal deep operations deficiencies, requirements, and C2 procedures.

(2) Propose and evaluate DOCC staff configurations and groupings of procedures to overcome DOCC shortfalls identified in the analysis. Reduce staff processing time required to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets. Identify manual procedures to automate.

(3) Evaluate/recommend improvements to enhance the effectiveness of deep attack operations. Assess DOCC capability to address deep operations C2 requirements.

c. Study impacts. This study will be used by D&SA BL to identify the inherent functions of deep attack operations C2 and establish an analytical basis to use in the evaluation of proposed changes in doctrine, organizational structure, and automation capabilities. Midway through the study, D&SA BL learned of an automated system in use at the V Corps CP. The Automated Deep Operations Coordination System (ADOCS) links the elements within the fire support cell (FSC) into an integrated C2 network and enhances the horizontal processing of information,

(combat information and intelligence, target nominations, fire support coordination measures, and air space coordination measures). All subscribers share operational information in ADOCS, tailor the information to their needs through the application of various filters, and add or exchange information at any time. ADOCS supports the fire support mission by giving the fire support community an automated system designed to expedite target processing among the members of the deep operations team. In light of its potential to improve deep operations C2 procedures, it was adopted by D&SA BL as the initial automated C2 system within the DOCC, and became a focal point of this study.

3. Analysis approach.

a. Methodology. This study was accomplished in two parts. First, a functional analysis of both doctrine and field SOPs was conducted to identify the procedures, functions, and tasks that support deep attack operations planning and execution. The functional analysis was verified during observations of the V Corps command post exercise CARAVAN GUARD 94. Second, a performance (network) analysis model of the tasks was developed and used to analyze two primary alternatives. After base comparisons were made between the doctrine and DOCC alternatives, additional analysis was conducted on variations of the DOCC alternative to find optimal performance of the DOCC.

b. Alternatives. The following two alternative structures were modeled and analyzed to meet the study objectives.

(1) Doctrinal alternative. The doctrinal alternative was developed from a review of current deep operations planning and execution doctrine, primarily field manuals 100-5, 100-15, 100-15-1; *Corps Operations, Tactics and Techniques*, September 1992, Coordinating Draft; FM 6-20-10; and Command and General Staff College (CGSC) Student Text 100-9. The literature review highlighted the deep operations tasks and procedures that support the C2 functions of planning, coordination, synchronization, and execution. The relationships among the tasks and the horizontal flow of information among staff sections in the corps main command post were then documented. The network was then represented in the Command and Control Network (C2NET) performance analysis model.

(2) DOCC alternative. A variation of the doctrinal alternative was used to represent the deep operations planning and execution procedures with a DOCC integrated into the corps CP. Distinctions between the alternatives were determined by a literature search of corps SOPs and direct observation of V Corps fire support cell (FSC) operations during CARAVAN GUARD 94. The primary difference is that responsibility to plan, coordinate, and synchronize execution of deep attack operations has been removed from the corps G3 plans and operations cells and placed in the DOCC. Accordingly, the data used for the performance of tasks was collected during CARAVAN GUARD 94 and reflects the use of automation to improve individual task processing.

c. Assumptions.

(1) Improving the performance of individual C2 tasks will result in improved effectiveness in the ability to plan and execute deep attack operations.

(2) All deep operations C2 tasks are performed within the corps main CP.

(3) The Command and Control Functional Area Model (C2FAM) database, which is used in C2NET, is reasonable and acceptable for use in C2 modeling and analysis.

(4) Data obtained from the July 1994 V Corps CARAVAN GUARD command post exercise (CPX) is an accurate representation of the time required to perform deep operations C2 tasks for a corps headquarters that uses a DOCC and ADOCS.

(5) Unit table of organization and equipment (TO&E) levels are fixed and personnel levels cannot be increased within the corps CP.

4. Analysis summary.

a. Functional analysis/observations.

(1) Corps commanders have restructured their FSCs to provide a formal deep operations chain of authority. Typically the corps artillery commander is given the responsibility to conduct continuous planning and coordination for deep attack operations. The corps artillery staff is augmented with traditional fire support agencies (Air (Force) liaison officer (ALO), Air Force support operations center (ASOC), electronic warfare (EW), Army airspace command and control (A2C2), air defense element (ADE)) and the corps aviation brigade CP. Taken together, the above agencies represent a DOCC. The DOCC is directly responsible to plan, coordinate, synchronize, and supervise execution of deep attack contingency plans (CONPLAN). This "corps targeting team" operates/interacts within the deep operations cell van of the FSC.

(2) The DOCC begins developing a deep attack operations CONPLAN immediately after receipt of the "deep operations intent" statement from the corps plans cell. The CONPLAN is developed simultaneously with fragmentary orders (FRAGO) to the corps operation plan (OPLAN). The DOCC directs refinement of the corps target acquisition plan, situation and decision support templates, attack guidance matrix, and high-priority target list in accordance with the deep operations intent. Additionally, the DOCC integrates current intelligence into developing CONPLANs to keep plans current with evolving conditions.

(3) The preferred deep attack weapon system of corps commanders is the Apache. It is used primarily between early evening nautical twilight (EENT) and before morning nautical twilight (BMNT) to take maximum advantage of its technological enhancements and to improve its survivability. The Army tactical missile system (ATACMS) is used primarily to attack high payoff targets of opportunity and provide suppression of enemy air defense (SEAD) fires for Apache missions.

(4) The *Decide-Detect-Deliver* targeting methodology has been expanded in the field to a *Decide-Detect-Track-Deliver-Assess* methodology. *Tracking* has been added to the *Detect* phase because high-payoff targets typically have a short dwell time; therefore, decisions to attack them must be made rapidly, which would be consistent with changing dynamics of the battlefield and the commander's intent. The importance of a *tracking* subfunction to detection cannot be overemphasized. *Assessment* has emerged as a key subfunction of the *Deliver* phase because it provides the feedback necessary to continue the targeting process.

(5) The DOCC fully integrates the corps aviation brigade staff into the development of and coordination for deep attack CONPLANs. The structure allows the brigade staff to develop the aviation portion of the CONPLAN, immediately begin to coordinate SEAD fires with the target analysts, and deconflict routes with A2C2. The DOCC structure also establishes a formal sequence of daily planning and coordinating meetings in the FSC to ensure deep attack plans are synchronized with the corps collection plan and future corps operations.

b. Analytical findings.

(1) Doctrinal versus DOCC alternatives. The DOCC alternative had faster overall processing times for both the planning and execution cycles and fewer bottlenecks (stale target nominations).

(a) The overall processing time for deep operations planning tasks was 1,452 minutes for the doctrinal alternative and 948 minutes for the DOCC alternative. The primary reason for the greater time in the doctrinal alternative is that it requires development of staff estimates and selection of a course of action (COA) prior to develop of a deep operations plan, whereas in the DOCC alternative planning begins with the receipt of the commander's concept for deep operations and is augmented with staff estimates as they are completed.

(b) For the execution cycle, the DOCC alternative was faster than the doctrinal alternative for every task evaluated. The average time to complete the execution processing per target was 85.15 minutes for the doctrinal alternative and 31.81 minutes in the DOCC alternative. The improved processing times for all tasks in the DOCC alternative is directly attributable to the use of ADOCS and other automation (WARRIOR and MCS) to expedite the horizontal processing of targets within the DOCC and other staff sections in the FSC.

(c) The analysis revealed that queues developed in the A2C2 section and were the predominant cause of numerous stale target nominations in both alternatives (this was consistent with observations of V Corps CARAVAN GUARD 94). The DOCC alternative had a larger number of target nominations in queues (1.43 to 1.09) and the target nominations remained in queues longer (38.02 minutes to 33.67 minutes) compared to the doctrinal alternative. However, the DOCC alternative processed more targets overall (67 percent compared to 23 percent for the doctrinal alternative) and had fewer stale target nominations (332 to 655). In the DOCC alternative, ADOCS is used to shorten the processing time of the tasks preceding those that are performed by the A2C2 section. Although the A2C2 section used ADOCS to receive target nominations and transmit cleared ones, the actual mechanics of coordinating and clearing a

nomination and deconflicting airspace is still performed manually. Consequently, target nominations were presented to the A2C2 section at a rate faster than they could be processed, increasing the likelihood of becoming stale.

(2) DOCC sensitivity analysis. As a result of identifying the preponderance of stale target nominations in the A2C2 section during the comparative analysis, the sensitivity analysis focused on identifying ways to improve overall processing time and reducing the quantity of stale target nominations. Alternatives were developed to incrementally decrease task processing time, increase the number of personnel to process tasks, and a combination of both for the A2C2 section. Results of the sensitivity analysis follow.

(a) To determine the potential for continued improvements in performance, the processing time for A2C2 tasks was reduced in 10 percent decrements and the DOCC simulation was rerun. The time reductions simulate potential enhancements in automation to better support the A2C2 section. As expected, each alternative resulted in a decrease in the total number of targets that became stale. The greatest reduction and rate of reduction in stale targets occurred at a 30 percent decrement in processing time. However, the average queue time was still long (reduced from 38.08 from 27.25 minutes) and there were still 198 targets nominations that became stale.

(b) A different approach to improving the DOCC alternative was performed by increasing the quantity of personnel in the A2C2 section. The quantity of four personnel was increased by 50 and 100 percent with the task processing time being held constant at the original A2C2 task processing time. Both alternatives reduced the number of stale targets; the greatest improvement occurred in increase 50 percent alternative (332-133=199, or a 60 percent decrease in the number of stale targets compared to alternative 3). The increase 100 percent alternative only reduced the number of stale targets by an additional 10 percent (332-101=231, or a 70 percent decrease).

(c) Although the 50 percent increase in A2C2 staff alternative had a smaller number of stale targets than the 30 percent time decrement alternative, the average A2C2 staff processing time for the DOCC alternative was greater, as was the overall processing time for the execution cycle. Increasing the size of the A2C2 staff section by reallocating personnel reduced the number of target nominations that became staleand the overall average processing time.

(d) Another alternative was developed, which both reduced the processing time for A2C2 staff task processing time by 30 percent and increased the size of the A2C2 section by two personnel. This alternative reduced the execution cycle processing by 56 percent and the number of stale target nominations by 63 percent compared to the DOCC alternative and processed 34 percent more target nominations. This alternative (reducing A2C2 task processing time by 30 percent "through automation" and increasing the A2C2 section from 4 to 6 personnel) integrated automation to reduce task processing time and addresses the need to simultaneously process multiple messages and target nominations.

4. Conclusions.

a. Conclusions resulting from functional analysis/observations.

(1) Corps commanders have reorganized their FSC staff to create a DOCC. DOCC is the principal staff agency responsible to plan and execute deep attack operations.

(2) The DOCC's singular focus on deep attack operations allows it to coordinate and synchronize CONPLAN more effectively than current doctrinal methods.

(3) DOCC provides a more comprehensive structure to plan and coordinate aviation and fixed-wing assets with fire support weapon systems. A 24-hour cycle of scheduled meetings allows for continual evaluation and refinement of both sensor collection and deep attack plans.

(4) The increased significance of deep attack operations has made the ability to *track* specific key targets an important subfunction of the *detect* process and stresses the importance of *assessment* as a subfunction of the *deliver* process.

b. Conclusions resulting from analytical findings.

(1) Automation has the greatest effect in reducing the processing time of individual tasks that support the planning and execution of deep attack operations, but cannot solely improve efficiency. Reorganization of the staff and using automation to reduce the processing time of individual tasks makes the DOCC alternative more efficient (shorter planning and executing times and fewer bottlenecks and smaller queues) than the doctrinal alternative.

(2) The most efficient automation enhancement is to refine and document the procedures necessary to deconflict corps airspace with U.S. and allied fire support systems (Army, Air Force, Naval gunfire and aviation) and apply automation capabilities to improve performance. Currently ADOCS speeds the passing of information among the staff sections in the CP, but processing the information within the staff section often depends on "man-in-the-loop" procedures before it is passed to the next staff section via the automated system. A2C2 procedures are more affected by this limitation than other staff sections that make up a DOCC because its functions encompass all of the deep attack weapon systems in the corps. Army, Air Force, Navy, and allied C2 procedures come together in the A2C2 section before a target nomination can be approved. As a result, the A2C2 section is a natural bottleneck for the processing of information and target nominations and, therefore, the most likely place to apply technology. Reducing the time required to clear target nominations will greatly improve the effectiveness of corps deep attack operations.

(3) Advances in technology provide the means to improve the efficiency of DOCC operations in terms of the time required to develop and coordinate deep attack CONPLANs and process, deconflict, and clear high-payoff targets of opportunity. The most efficient automation enhancement would automate air space clearance procedures in the A2C2 section.

6. Recommendations.

a. Include *track* and *assess* in the *decide-detect-deliver* methodology.

b. Continue development and refinement of the DOCC concept, with the result being a doctrinal revision to corps TO&E to reflect a dedicated DOCC to plan and execute deep attack operations. The cell should fully integrate all agencies that have a role in corps deep attack operations (corps artillery staff, corps aviation brigade staff, corps G3 plans, A2C2, and corps G2). The cell must also have the authority to immediately execute deep attack operations in accordance with the commander's intent for these assets.

c. Continue development and refinement of ADOCS as a key component of DOCC automation. Use its interactive graphical capabilities as the start point for continued development of future fire support C2 systems. Place first priority for ADOCS enhancement with automating air space clearance procedures in the A2C2 section.

d. Perform additional analysis and experiments to determine the value of:

(1) Refining A2C2 procedures to clear ATACMS missions. Explore methods to integrate automated systems in the ASOC with the ADOCS to ultimately create one element to coordinate and control the corps airspace.

(2) Developing automated graphical decision aid tools to support the wargaming process. Ultimately, the capability should allow several different courses of action (COA) and CONPLANs, with different task organizations, to be entered and fought. Additionally, the display should access existing target data bases and allow the input of routes and axes of advance. Finally, the tool should have a rough force-on-force simulation modeling tool to quantify the expected results of the various COAs.

(3) Developing methods to integrate ADOCS display and graphics capabilities with the Advanced Technologies' "corps command post" system. A need exists to integrate the deep attack CONPLANs graphics and routes with the digitized terrain of the corps command post system, and allow the commander to interact with the display and modify routes, axis of advance, and engagement areas in accordance with his intent.

e. Conduct analysis to determine the resulting impact on combat effectiveness of the DOCC organization and ADOCS automation.

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DEEP OPERATIONS COORDINATION CELL (DOCC) ANALYSIS
CHAPTER 1
INTRODUCTION

1-1. Purpose. The purpose of the DOCC analysis was to identify deep operations C2 procedures (functions, processes, tasks, and subtasks) and to evaluate various DOCC configurations to identify improvements to deep operations C2 procedures. The configurations varied by: where (which staff section) deep operations tasks were performed, the sequence of task performance and whether selected tasks were performed in series or in parallel (task flows), and which tasks could be automated to gain efficiencies in the network.

1-2. Problem statement (figure 1-1). The military must streamline the command, control, communications, computer, and intelligence (C4I) process to maximize combat power. **For critical deep attack operations** (especially against opponent theater missiles), **the planning, coordinating, and synchronizing times and executing ("sensor-to-shooter") timelines are too long** [to engage highly mobile and "shoot-'n-scoot" targets].

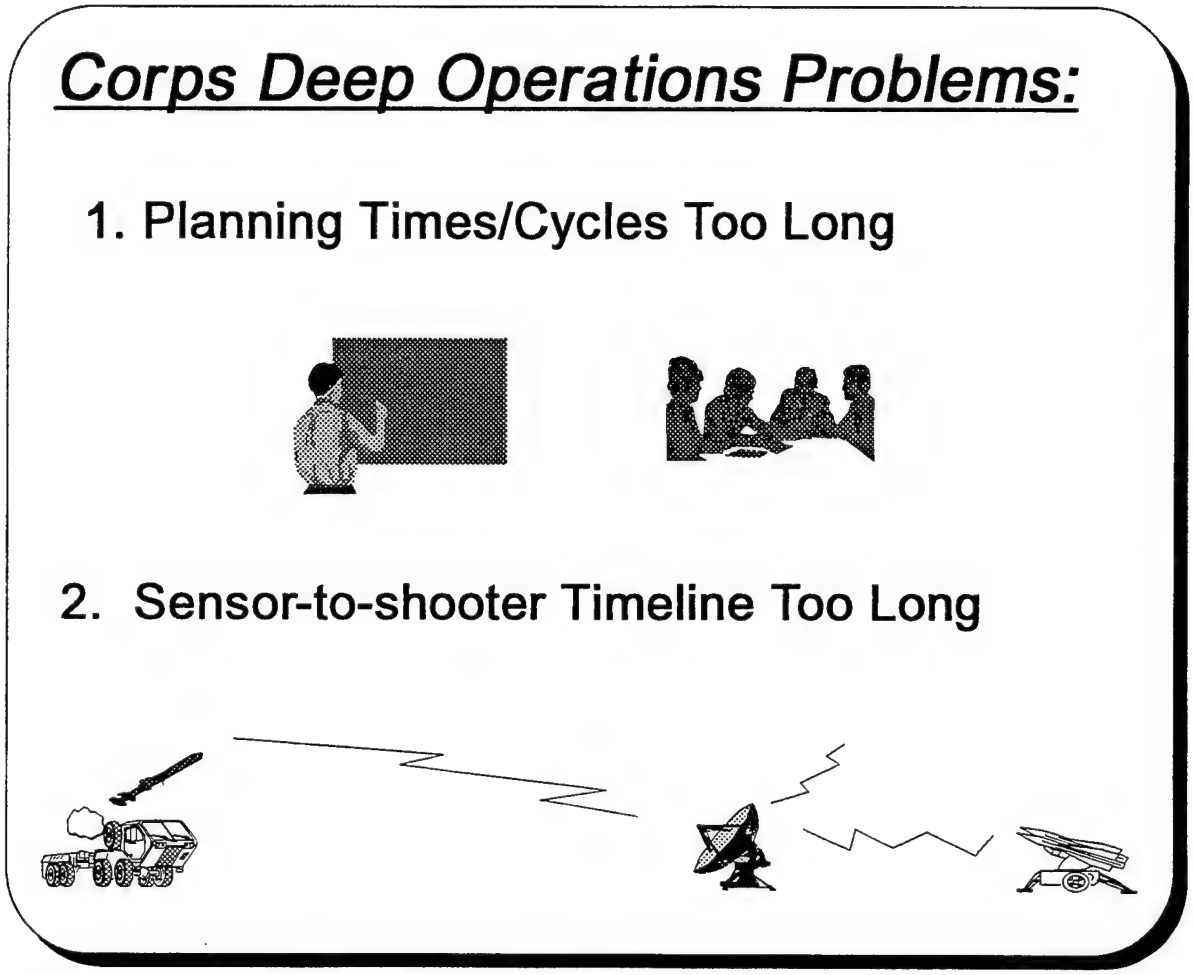

Figure 1-1. Problem statement

1-3. Background.

a. Deep attack operations during Desert Storm revealed C2 problems, as found in the Field Artillery Attack Operations Study, Dec 92, and the *EAC and Corps Deep Operations Handbook (1992-2000), Tactics, Techniques, and Procedures (TTP)* manual, 30 Sep 92.

(1) The speed, mobility, and lethality of modern joint weapon systems outran operations orders, which required three days to prepare but only hours to execute. Long (sensor-to-shooter) times were required to identify, locate, and confirm targets; obtain "commander" approval to engage identified targets; identify and notify attackers (i.e., shooters); and compute technical data to fire on the target. "Sensor" includes all national command and all military intelligence systems available. [Today, the Army can see farther than it can shoot and it can acquire and nominate faster than its C2 systems can coordinate and engage highly mobile targets.]

(2) The targeting process was convoluted by the multitude of players and the changing prioritization of targeting objectives.

(3) There was an inequitable integration of target submissions from subordinate elements.

(4) There was a failure to integrate the efforts of key intelligence and fire support (FS) cells.

(5) There was a lack of battlefield damage assessment (BDA) collection plan.

(6) Automated data bases did not contain enough data fields to describe and manipulate targets nor were they adequate to handle the volume of targets.

(7) During the initial phases, the movement of the FS coordination lines (FSCL) was cumbersome and often executed without sufficient time for the Air Force to implement.

(8) There were doctrinal differences between the Army and Marine Corps over the authority to fire across boundaries beyond the FSCL.

(9) Army ground liaison officers to the various Air Force flying units were not centrally controlled by any particular echelons above corps (EAC) agency such as G3 Deep Operations or Operations.

(10) There was not a doctrinal provision for a fire support element at EAC.

b. Current reasons to improve deep attack operations.

(1) Numerous, politically questionable countries have the resources to buy or build theater missiles. It is imperative that the U.S. military develop the capability to "*decide-detect-deliver,*" especially with respect to enemy theater missiles (TMs).

(2) The capability to plan, coordinate, and synchronize attacks on enemy C2 facilities, follow-on maneuver forces, logistics bases and trains, and air defense systems deep must be improved. The results of deep attacks must be relayed quickly to the planners of close operations to determine the impact on the close battle.

1-4. Impact of the problem.

a. Current deep attack operations employment doctrine is evolving and does not totally support integration of deep attack with close battle space operations. The separation of these two battle space areas negates the capabilities that technology provides in reducing time and space in the commander's engagement of critical enemy assets that can dramatically influence the conduct of operations throughout the depth of the battlefield.

b. Current man-in-the-loop coordination procedures at corps level have minimized the benefits of vertical coordination nodes laid out in the "*decide-detect-deliver*" targeting methodology of current doctrine. The inability to rapidly process the improved target detection, identification, classification, and other near-real time information available from current assets means that deep attack assets fail to meet the increased demands of changing strategic missions. Improvement of the planning, coordinating, synchronizing, and executing processes are critical for deep attack operations to serve effectively as a precision strike option in the deep battle space.

c. Objective automation solution. The U.S. Army is developing the Army Battle Command System (ABCS), an automated C4I system that will be used to provide commanders a common picture of the battlefield; project situations, requirements, and capabilities; determine the impact of possible courses of action; develop staff estimates; and present findings and recommendations. ABCS will assess information from diverse sources, incorporate this information into the decisionmaking process, and interface with other C2 systems to assist the development of optimal courses of action. ABCS will use common hardware and software to the maximum extent possible. ABCS will not be available as a total system until the 21st century. Twenty-first century commanders will have the capability to see the entire battlefield in depth, identify key targets -- particularly moving and short-dwell targets -- and attack with a wide choice of joint, as well as Army, systems whenever and wherever the commander desires. Depth and simultaneous attack means will vary greatly. They will include air, Army aviation and ground maneuver units, joint precision fires, psychological operations, information operations, and employment of special operations forces (SOF). These various means of attack will be horizontally and vertically integrated by a fully digitized joint and combined arms target-acquisition, hand-off, and strike system -- a component network of ABCS.

d. Proposed interim solution. The Director of D&SA BL has proposed development of a DOCC to approach the above capabilities in 1994. The DOCC will use existing hardware and software that have been developed independently to consolidate and automate as many functions as possible until ABCS is available. Separate computers will be linked together and software integration programs will be developed to share data. The ADOCS, being jointly developed by V Corps and the Advanced Research Projects Agency (ARPA) for horizontal processing of targets, is the beginning of an interim automated system to improve the C2 processes for deep operations.

1-5. Scope (figure 1-2). This analysis examined DOCC within the corps main CP. The focus of this study was to conduct analyses by recommending the sequence of deep operations C2 procedures to plan, coordinate, synchronize, and execute deep operations (*doctrine*); corps staff configurations (*organization*); and potential automation opportunities (*materiel*) to improve deep operations C2 procedures. The C2 procedures were translated into functional flow diagrams from which a computer model was developed. The model was used to test and analyze alternative configurations and identify opportunities for automating to enhance the ability of the corps to conduct deep operations. This study did not measure the ability of a DOCC to link the deep and close battles nor consider the mechanics of delivering munitions from shooters to targets.

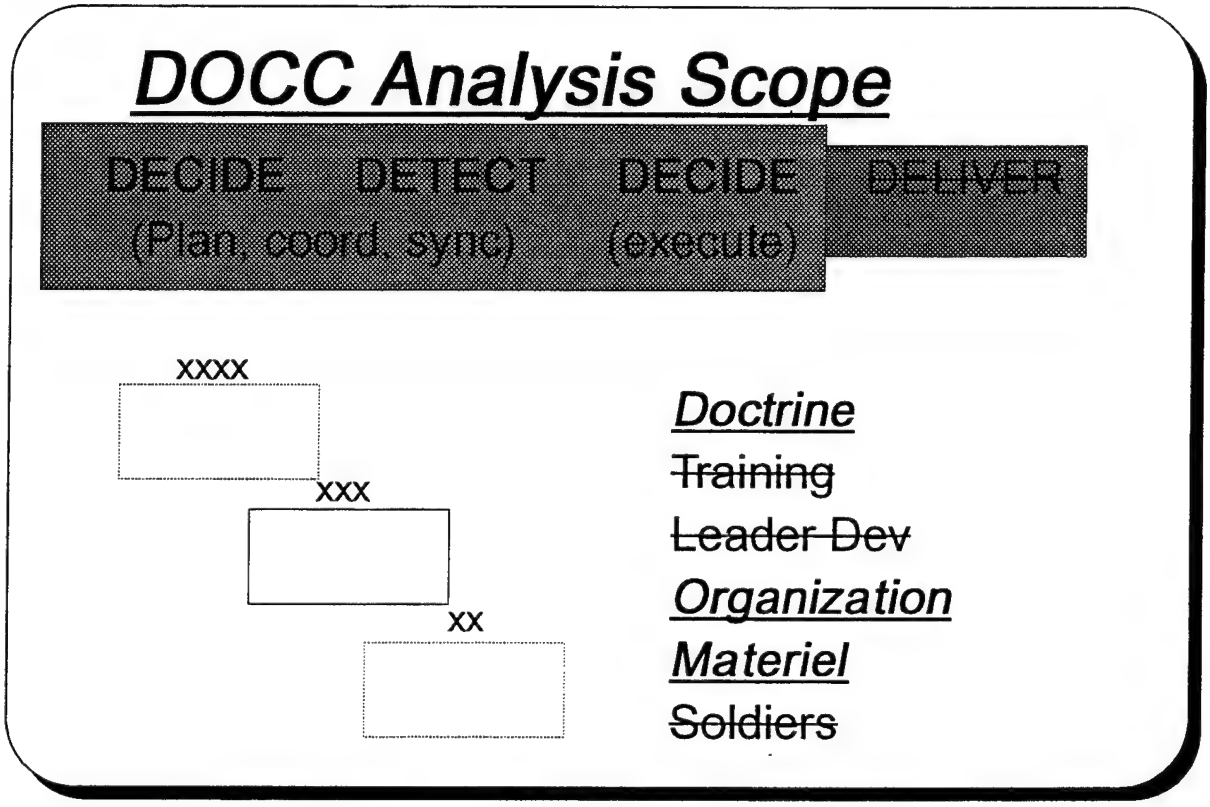

Figure 1-2. Scope

1-6. Assumption. Regrouping and selectively automating procedures to reduce bottlenecks, number of "stale" messages, and length of critical path(s) will improve our ability to conduct theater missile defense (TMD); engage enemy C2, follow-on maneuver forces, operational reserves, and logistics (sustainment); and conduct SEAD.

1-7. Objectives.

a. Identify doctrinal deep operations deficiencies, requirements, and C2 procedures with functional flows.

b. Propose and evaluate DOCC staff configurations and groupings of procedures to overcome DOCC shortfalls identified in the analysis. Reduce staff processing time required to plan,

coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets. Identify manual procedures to automate.

c. Evaluate/recommend improvements to enhance the accuracy and effectiveness of DOCC. Assess DOCC requirements for the sequence of performing C2 procedures.

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CHAPTER 2
METHODOLOGY

2-1. Study intent. This study will be used by D&SA BL to identify the need for and functions of a proposed organization or set of C2 procedures that focus on deep operations (figure 2-1).

a. The two primary deep operations C2 functions are "*plan*" and "*execute*." To perform these functions, staff personnel must coordinate and synchronize (current doctrine does not provide a staff section to specifically perform deep operations planning and execution).

b. Corps in the field are organizing staff pools and developing procedures and automation to improve deep operations C2 to meet the increased capabilities of sensor and weapons systems. Lessons learned from the corps must be reflected in evolving doctrine.

c. Continued enhancements in automation procedures are required to attack deep to isolate the enemy and set the conditions necessary for success in the close battle.

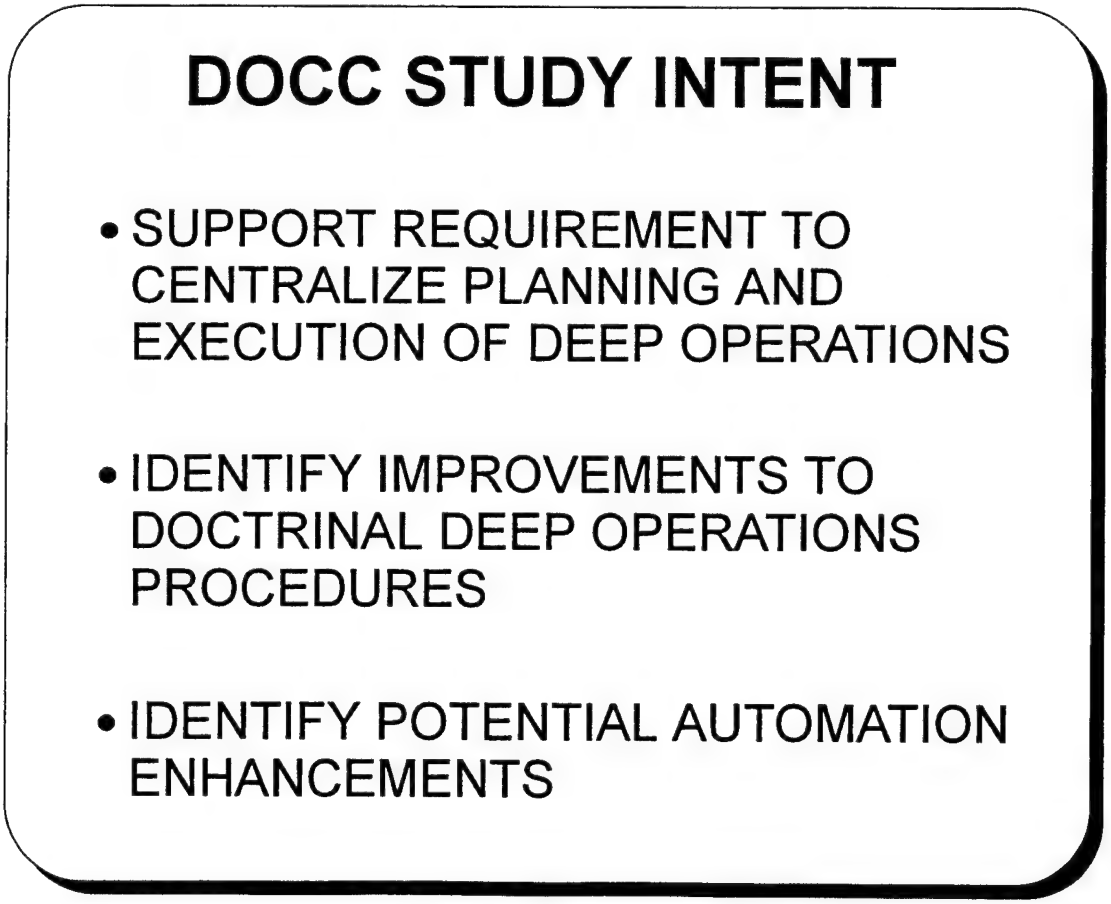

Figure 2-1. Study intent

2-2. Study methodology.

a. This study was conducted in two major phases: functional analysis (chapter 3) to identify deep operations C2 procedures, staff sections, inputs/outputs, and structural network (objective 1, figure 2-2); and performance analysis (chapter 4, objectives 2 and 3, figure 2-2).

(1) During the functional analysis research of doctrinal FMs; draft corps tactics, techniques, and procedures; corps Army Training Evaluation Program (ARTEP); and corps field SOPs was completed that resulted in a functional laydown of corps deep operations C2 procedures (essential elements of analyses (EEA) 1 through 4). The functional laydown was provided as an interim report to D&SA BL and other agencies involved in DOCC development. During the conduct of this phase, D&SA BL learned of an ongoing V Corps initiative to develop an Automated Deep Operations Coordination System (ADOCS). D&SA BL concluded that ADOCS would serve as an interim DOCC and a start point for future DOCC development. The functional laydown was validated by observations during the July 1994 V Corps CARAVAN GUARD CPX.

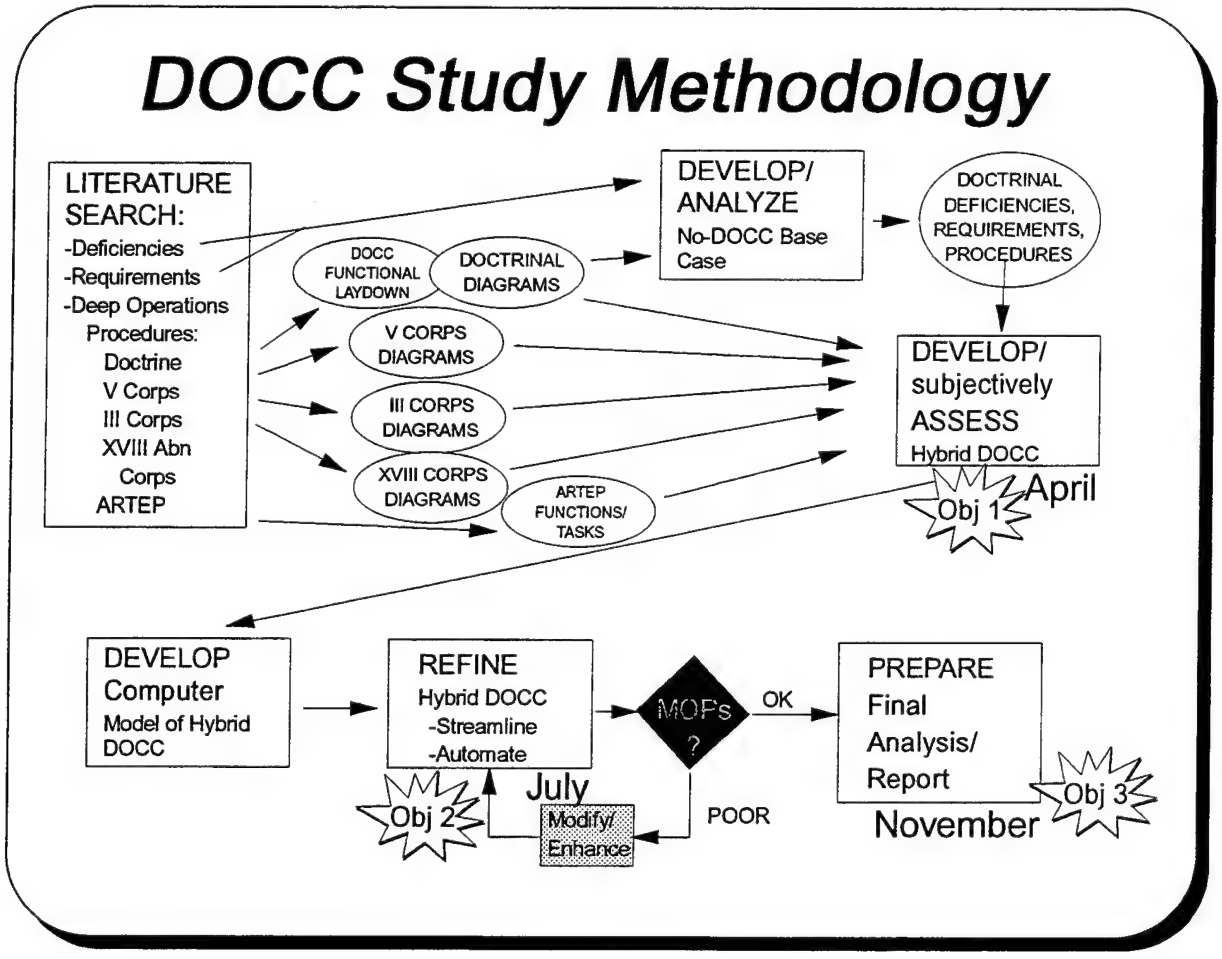

Figure 2-2. Study methodology

(2) During the performance analysis phase, the functional laydown was represented in a computer network (performance) model which was used to asses the variables of: where (which staff section) deep operations tasks were performed, the sequence of task performance and whether tasks were performed in series or in parallel (task flow), and which tasks could be automated (EEAs 5 through 7).

2-3. Alternatives. The following two alternative structures were modeled and analyzed to meet the study objectives.

a. Doctrinal alternative. The doctrinal alternative was developed from a review of current deep operations planning and execution doctrine, primarily FMs 100-5, 100-15, 100-15-1; *Corps Operations, Tactics and Techniques*, September 1992, Coordinating Draft; FM 6-20-10; and CGSC Student Text 100-9. The literature review highlighted the deep operations tasks and procedures that support the C2 functions of planning, coordination, synchronization, and execution. The relationships among the tasks and the horizontal flow of information among staff sections in the corps main command post were then documented. The network was then represented in the C2NET performance analysis model.

b. DOCC alternative. A variation of the doctrinal alternative was used to represent the deep operations planning and execution procedures with a DOCC integrated into the corps CP. The differences between the alternatives were determined by a literature search of corps SOPs and direct observation of V Corps FSC operations during CARAVAN GUARD 94. The primary difference is that responsibility to plan, coordinate, and synchronize execution of deep attack operations has been removed from the corps G3 plans and operations cells and placed in the DOCC. Accordingly, the data used for the performance of tasks was collected during CARAVAN GUARD 94 and reflects the use of automation to improve individual task processing.

2-4. Essential elements of analysis (EEA). The EEAs are grouped into two areas.

a. The following set of EEAs address study objective 1: Identify doctrinal deep operations deficiencies, requirements, and C2 procedures with functional flows.

(1) EEA 1. What C2 procedures (functions, processes, tasks, and subtasks) are required to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?

(2) EEA 2. Which staff sections perform deep operations C2 procedures (doctrine, V/III/ XVIII Corps).

(3) EEA 3. What are the inputs and outputs of each C2 procedure, what is the source of each input, and who is/are the recipient(s) of each output?

(4) EEA 4. What is the best structural network (the flows and "triggers" of tasks in series or parallel through the various staff sections/cells) to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?

b. The following set of EEAs address study issue 2: evaluation of deep operations C2 structures and procedures. EEA 5 was modified by the sponsor (D&SA BL) before the work was begun.

(1) EEA 5. What is the composition and manning level requirement for the DOCC to make deep operations C2 procedures more efficient in terms of accuracy, timeliness, and effectiveness?

(2) EEA 6. How can planning, coordinating, synchronizing, and executing timelines be reduced using DOCC? How can the procedures be grouped and automated to reduce bottlenecks, stale messages, critical paths, and timeline(s)?

(a) What are the processing bottlenecks, i.e., where are queues built up that result in stale messages and target nominations (that become old before they can be processed)?

(b) What is the processing critical path (longest route through the network)?

(c) What deep operations C2 procedures should be automated?

c. The following EEA addresses study issue 3: evaluation/recommend imporvements to enhance the accuracy and effectiveness of DOCC. EEA 7. Which enhancements yield the most efficient DOCC and employs deep attack weapons/systems most effectively?

2-5. Measures of performance (MOP). EEAs 1 through 4 were addressed through a literature search resulting in functional laydowns of deep operations C2 procedures (chapter 3); no MOPs were required for this analysis. The following MOPs were used to address EEAs 5 through 7 in the performance analysis (chapter 4).

a. Times to plan (*decide*), coordinate, and synchronize and execute (*detect-deliver*) deep operations.

b. "Bottlenecks," defined as places in the model (representing staff sections in the performance of C2 procedures) that result in stale messages or targets in queues due to the lack of sufficient staff personnel or too many messages or targets to process.

(1) Number and location of "bottlenecks."

(2) The quantity of messages (targets) in queue and the quantity of queued targets that become obsolete before being processed (in other words, the sensor-to-shooter time, to include processing tasks and queue times, would exceed the dwell time of the target).

(3) Average length of time messages in queue.

c. Efficiencies.

(1) Number of messages processed.

(2) Number and location of stale messages.

(3) Percent of staff utilization (the percent of time each staff person, on average, is busy performing C2 procedures).

(4) Time length of longest path.

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DEEP OPERATIONS COORDINATION CELL (DOCC) ANALYSIS
CHAPTER 3
FUNCTIONAL ANALYSIS

3-1. Introduction. This chapter describes the functional analysis which resulted in a description of deep operations C2 procedures (functions, processes, tasks, and subtasks), staff sections, inputs/outputs, and structural network. This functional analysis was required before modeling and analysis could be performed, both to understand the procedures and to be able to generate potential alternative improvements for analysis during the performance analysis phase of the study, as described in chapter 4.

3-2. Literature search approach. Extensive literature searches were conducted of FMs and field standing operating procedures (FSOPs) to support the function analysis presented in this chapter. To better understand the functional analysis, an understanding of the deep operations concept (this study had a corps focus) and the *decide-detect-deliver* targeting methodology is helpful.

a. Corps plan. The basic orientation of the corps' plan is to accomplish its mission through either defensive or offensive operations as prescribed by EAC. The corps plan is based upon four principal requirements (figure 3-1). First, the corps must control key engagements in the close arena. Concurrently, the corps must deny the enemy the ability to concentrate combat power by attacking follow-on forces at depth. This will deny the enemy the capability to interfere with the corps operations. Finally, the corps must conduct successful rear-area operations to retain

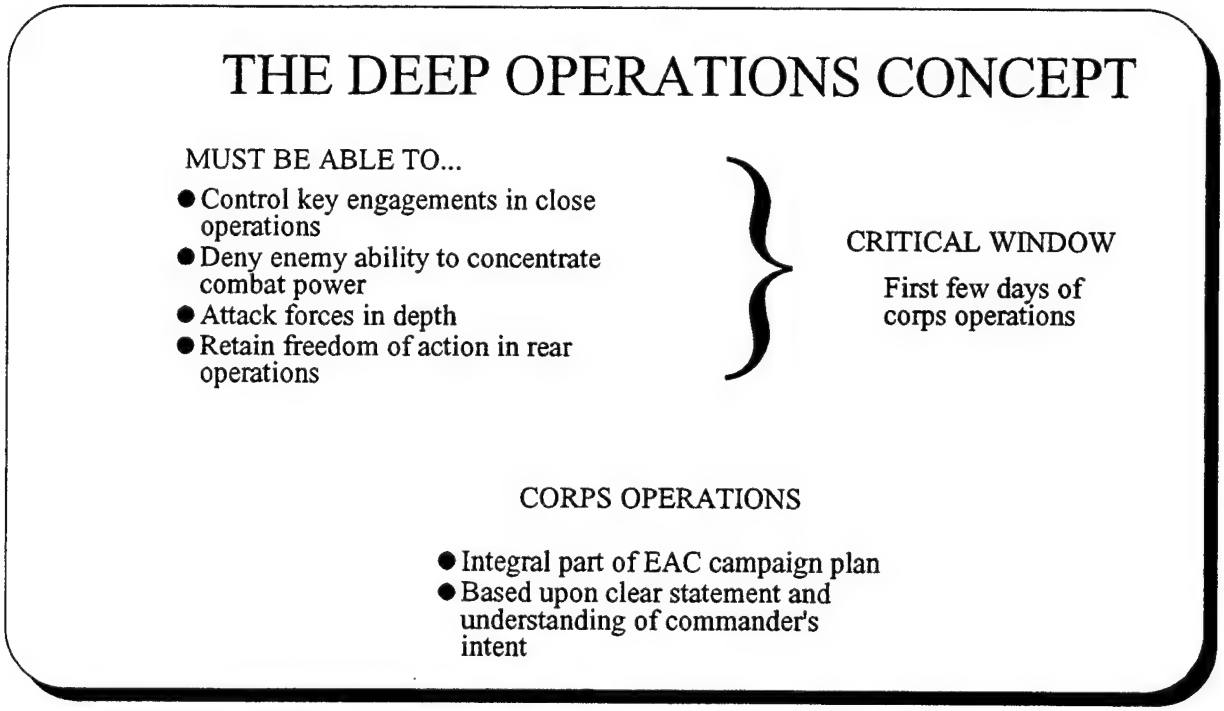

Figure 3-1. The deep operations concept

freedom of action. The execution of these tasks is most critical in the first few days of an operation when the enemy will attempt to rapidly concentrate numerically superior forces and fires to defeat the corps. Central to this concept is the notion that the corps operates within the broader framework of the EAC operation; allocation of resources to the corps will be in concert with the EAC plan. The conduct of corps operations is based upon a clear, detailed statement of intent by the commander. This is a prerequisite for effective C2.

b. *Decide-detect-detect* targeting methodology. The objective of attacking targets deep on the battlefield is to delay, disrupt, or destroy those enemy forces, facilities, and high payoff systems which could interfere with successful mission accomplishment. The preferred proactive targeting methodology to wrest the initiative from the enemy or to shape the future close fight requires the corps to decide, then detect, then deliver. Overlaying the sequence of events in the *decide-detect-deliver* process requires a C2 system to rapidly distribute information vertically and laterally among CPs. C2 is both the area of greatest potential payoff and greatest potential vulnerability.

(1) The *decide* step provides the focus and priorities for collection management, target development, and fire planning. It is oriented by the intelligence estimate of the situation, the commander's mission analysis and intent, battlefield planning (which projects future friendly operations), an in-depth knowledge and understanding of the most probable enemy response(s) to the projected friendly operation, and a decision regarding options to deny enemy means for interference. It addresses the questions: What should we look for? Where can it be found? Who can locate it? and How should it be attacked?

(2) The *detect* step executes the decisions made in the decide step by tasking collection, processing, and analysis assets to develop targets collected for targeting. This step is accomplished by ensuring that the appropriate sensor(s) are in position at prescribed times and in search of designated, specific enemy observables which, when detected, are communicated to the corps tactical operations center for confirmation of the attack decision or, in exceptional cases, directly to a fire support system as an attack trigger event.

(3) The *deliver* step links sensors to shooters. The designated lethal and non-lethal fire support (FS) systems respond to and execute the *decide* decisions on what was to be attacked. This step is executed rapidly by having designated FS systems immediately engage the previously decided target based on sensor detection of a trigger event or projected target activity.

3-3. Literature search sources. The sources used in the literature search of doctrinal publications (see references, annex 1 of appendix A) are as follows.

a. EEA 1. *What C2 procedures (functions, processes, tasks, and subtasks) are required to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?*

(1) The format of C2 procedures was based on the taxonomy found in the *Fire Support Functional Decomposition (Redbook),* edition III, May 1992, published by the U.S. Field Artillery

School. Included are functions, processes, tasks, and subtasks [a level of sub-subtask was added by the TRAC study team] (figure 3-2).

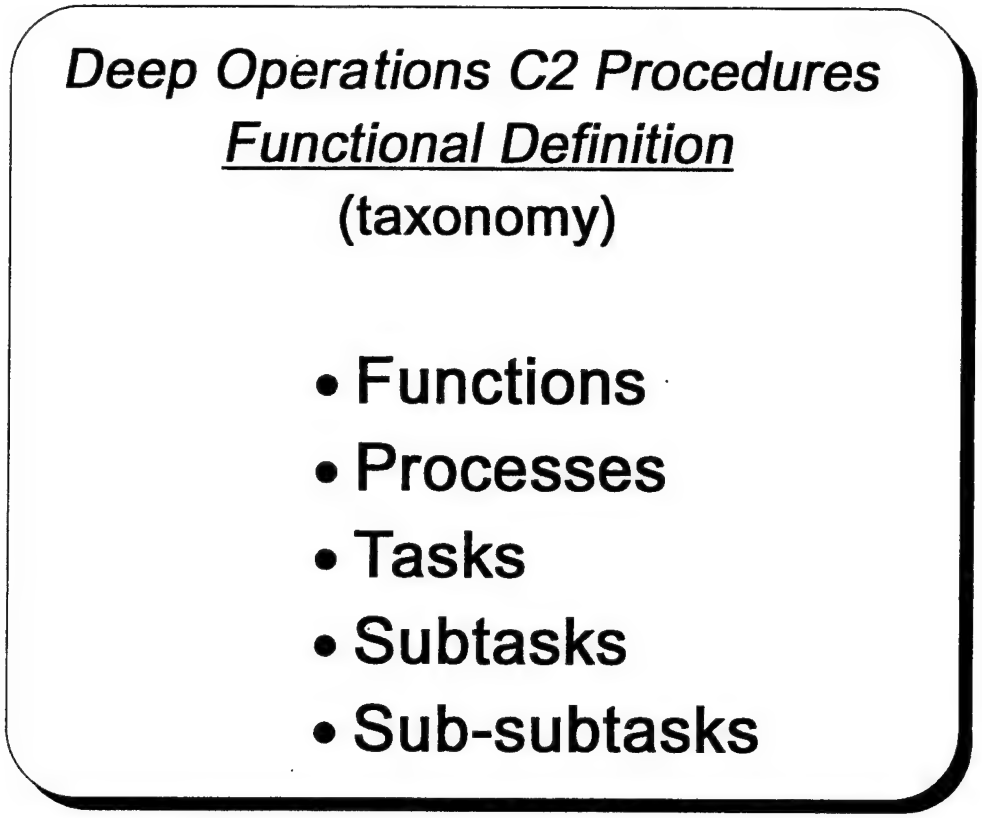

Figure 3-2. Hierarchy of C2 procedures

(2) Three iterations of the functional analysis were performed, beginning with function/task lists from the five primary C2 elements of the Army Tactical Command and Control System (ATCCS), then III and V Corps field SOPs, and, finally, corps ARTEP 100-15-MTP.

b. EEA 2. *Which staff sections perform deep operations C2 procedures (doctrine, V/III/ XVIII Corps)?* All corps are organized differently, and all are different from doctrinal publications. Diagrams of the corps level staff sections involved in the planning and execution of deep operations are provided in paragraph 3-4.

c. EEA 3. *What are the inputs and outputs of each C2 procedure, and what is the source of each input and who is/are the recipient(s) of each output?* A separate flow diagram (figure 3-3 and appendix I) was developed for each task/subtask. These diagrams were developed using information from the corps ARTEP, FMs pertaining to fire support in the 6-20 series, and CGSC Student Text 100-9, *The Tactical Decisionmaking Process.* The diagrams represent the flows of tasks in accordance with doctrinal references.

(1) Each diagram contains the task/subtask number (from EEA 1) and name identification (center box).

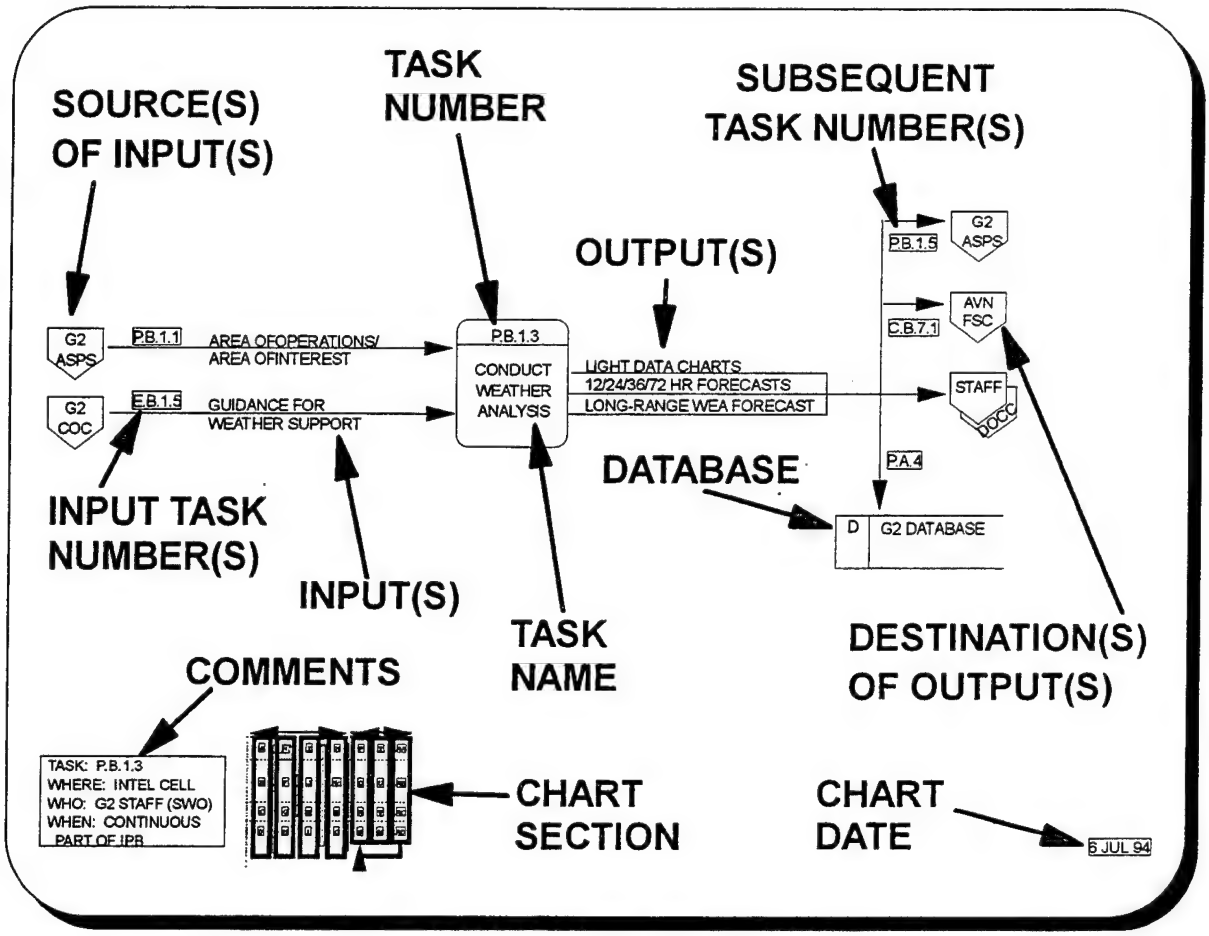

Figure 3-3. Key to task flow diagrams

(2) Information regarding who and during which phase the task is performed (lower left-hand box).

(3) The necessary input(s) with the task number that generated the input (the lack of a task number implies the input was derived from a continuous process or obtained from a source not considered key to the deep operations effort) and the identification of the staff section that developed each input.

(4) The output(s) produced by performing the task/subtask, the recipient(s) of the output(s) (the staff section(s) that needs the output as an input to accomplish follow-on tasks), and the task number(s) that will be performed subsequently using the output as input from this task/subtask.

d. EEA 4. *What is the best structural network (the flows and "triggers" of tasks in series or parallel through the various staff sections/cells) to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?* This network represents the flow of tasks (from EEA 1) through the corps staff sections (EEA 2) that perform deep operations C2 procedures. The network is organized by the planning and execution functions. Each function is decomposed into phases as found in the tactical

decisionmaking process of CGSC Student Text 100-9. The process can be described in two levels: the formal deliberate decisionmaking process (DDP) [the "crawl" portion of the tactical decisionmaking process] and the combat decisionmaking process (CDP) [the "run" portion, where advanced applications of tactical decisionmaking are required].

(1) DDP breaks down the entire decisionmaking process into discrete steps to describe the components of each step and provides the most thorough approach available in unconstrained time environments. The DDP arrives at an acceptable solution to a tactical problem by analyzing in detail a number of friendly options against the full range of reasonable and available enemy options. The resulting plan then serves as an excellent and complete start point for later quick and effective adjustments as the command begins actual combat operations.

(2) The CDP is a condensed process that allows the command to decide, move, and execute in the limited time available in high tempo operations. The CDP facilitates the demands of the ongoing operation by matching the realities of the high tempo battlefield, where windows of opportunity for action are fleeting and tactical demands continuously challenge the command. The CDP is driven by the commander using his expertise and experience to arrive at a timely, acceptable solution, given the limited time available. It also requires the commander, in his assessment process, to anticipate the outcome of the current battle while setting the conditions that will link the outcome of the current operations with the future operations. It requires the commander to link that assessment over space and time with the next activity, branch, or sequel.

3-4. Results of literature search. The results of the literature search for EEAs 1 through 4 are discussed in this section. Lists, tables, and diagrams with some additional details are contained in appendixes B through M; the appropriate appendixes for each EEA is described in the discussions, below.

a. *Decide-detect-deliver targeting methodology*. The methodology has been expanded by corps in the field as found in field SOPs and observations during the July 1994 CARAVAN GUARD.

(1) *Deciding* which targets to attack depends on the commander's intent. The intent is the basis for the entire decisionmaking process.

(2) *Detect*. The *track*ing phase of the *detect* function is an essential element of the targeting process. Tracking priorities are based on the commander's intent and his targeting guidance. Not all targets will be tracked. The enemy activities that are tracked must support the overall plan.

(a) *Track/decide* has been added to *detect* as it is not always required or desirable to attack deep targets immediately upon detection. By choosing the time and place for execution of deep operations and using an optimum mix of weapon systems, greater effectiveness can occur.

(b) The length of time an enemy unit dwells in a certain location is a critical element in the tracking process. *Tracking* takes on a special importance when focusing on short dwell, high payoff targets which must be attacked rapidly. It is during this time that fire support officers and

coordinators, field artillery intelligence officers (FAIO), G2s, and G3s must ensure they clearly understand the commander's intent for fires relative to the deep fight.

(c) III and V Corps normally use their valuable, highly lethal Apache attack helicopters for night operations only to maximize their technological advantage over threat weapon systems and because of their daylight vulnerability. They track follow-on maneuver and FS forces during daylight and develop contingency plans for night attacks into preplanned engagement areas.

(d) V Corps uses a series of three meetings to lead up to each final "GO/NO GO" decision for a launch of Apaches. If they do not have an adequate *read (track)* of the enemy at each meeting, they will *decide* to postpone or abort the attack.

(3) *Deliver. Assess* has been added to evaluate the results of deep strikes to review allocation of deep attack assets against high priority target sets for future deep operations. Target damage assessment (TDA) can be active (through the use of organic sensors or "eyes on target"), or passive (such as the cessation of fires from an attacked area). Assessing target damage is the closure of the targeting process. If possible, TDA should be done on all targets. TDA priorities are set because of its limited resources and time.

b. EEA 1. *What C2 procedures (functions, processes, tasks, and subtasks) are required to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?* A separate set of processes, tasks, subtasks, and sub-subtasks were developed for each of the four functions.

(1) The four functions and respective supporting processes were developed at a meeting sponsored by D&SA BL at the U.S. Army Missile Command (MICOM) on 15 November 1993 for the purpose of beginning a functional analysis of deep operations.

(2) The supporting tasks, subtasks, and sub-subtasks were extracted from corps ARTEP 100-15-MTP by the TRAC study team. Draft task lists were staffed with III, V, and XVIII Corps and supporting battle laboratories of D&SA BL in March 1994. The task lists for planning, coordination, synchronization, and execution are found at appendixes B, C, D, and E, respectively.

c. EEA 2. *Which staff sections perform deep operations C2 procedures (doctrine, V/III/ XVIII Corps)?* All corps are organized differently, and all are different from doctrinal publications. Diagrams and discussions of the doctrinal, III Corps, and V Corps staff sections involved in planning and execution of deep operations are provided in appendixes F, G, and H, respectively (XVIII Airborne Corps SOPs were not available to develop diagrams). The diagrams include which corps-level staff sections and cells that perform deep operations C2 procedures. The quantities of personnel for the doctrinal and V Corps cases are found in appendixes J and K, respectively.

(1) Doctrinal corps (appendix F). There is no dedicated organization provided in doctrine or TO&Es to focus solely on deep operations. Doctrine (FM 100-15-1, *Corps Operations,*

Tactics and Techniques, September 1992 Coordinating Draft) provides dedicated personnel to target on a full-time basis and serve as the nucleus for the deep targeting team. These permanent staff members and those required staff agencies from other cells are brought together to develop a plan to accomplish the mission within the commander's planning guidance and intent. Since the FSC is actively involved in the targeting process on a full-time basis, it is recommended that the targeting team conduct its planning meetings in this cell. The FSC is where most of the key staff agencies are located to expeditiously facilitate the necessary coordination for deep target planning. The other staff elements of the targeting team also meet here for refinement of deep operations COAs. For aviation operations, this requires the concerted efforts of the entire corps main CP staff to coordinate and synchronize.

(a) When the corps commander makes a decision to commit aviation assets to attack a deep target, he has implied that this target set is his highest priority target. The extensive coordination and synchronization requirement of cross-forward line of own troops (FLOT) aviation maneuver is beyond the capability of the aviation brigade staff. The control and synchronization of the supporting actions (joint suppression of enemy air defense (J-SEAD), field artillery (FA) support, tactical Air (Force) (TACAIR), EW, etc.) must remain with the corps main CP. In order to command and control the aviation cross-FLOT operation, the corps commander may decide to establish an ad hoc organization to focus exclusively on this operation. It will control the execution of the operation, ensuring synchronization of activities and adjustment as necessary. This group should consist of the chief of staff (CoS), G3 plans officer, G3 current operations officer, aviation brigade S3, G2 Corps fire support coordinator (FSCOORD), and additional staff officers as required (air defense artillery (ADA), A2C2, EW, Air (Force) liaison officer (ALO), etc.).

(b) With the identification of a targeting team and the need to form an ad hoc group to plan and execute corps aviation assets, doctrine stops one step short of formalizing the requirement for a group of staff personnel to perform deep operations C2 procedures. Corps in the field have addressed this deficiency by forming groups of staff personnel to specifically plan and execute deep operations. These are described in the following paragraphs.

(2) III Corps (appendix G). Deep operations are the sum of all activities that influence when, where, and in what conditions the enemy forces can be committed against corps' close and rear areas. Deep operations against enemy forces not yet in contact establish these conditions by stripping away the enemy's ability to concentrate combat power, attack in depth, and mass his artillery. The III Corps artillery commander commands the Corps artillery to support deep operations and integrates the many diverse and dynamic corps staff agencies to synchronize the planning, execution, and assessments of corps deep operations.

(a) The corps FSC of the corps main command post (CP) is the focal point for the planning, integration, and coordination for the execution of deep operations. The FSC consists of the corps A2C2 element, air defense element (ADE), ASOC, G3 air, G3 aviation, EW, and chemical and corps artillery G3 operations, G2, and signal officer (SIGO).

(b) The fire support element (FSE) is part of the FSC. The FSE is organized into two cells for deep operations. The deep operations targeting cell (DOTC) is the targeting nerve center and lead targeting agency within the corps staff. The DOTC integrates, manages, and disseminates corps target planning and attack recommendations. The deep operations execution cell (DOEC) commands, controls, and executes deep operations.

(c) Much of the massing of the corps' combat power occurs because there is some flexibility built into the deep operations plan. The DOTC, in coordination with G3 Aviation, 6th Cavalry Brigade, and the battlefield control element (BCE), can attack an area with battlefield air interdiction (BAI) first; fire a SEAD program using cannon artillery, multiple-launch rocket system (MLRS), and ATACMS second; and while the non-lethal Air Force SEAD is in the area, launch an AH-64 deep attack.

(3) V Corps (appendix H). In 1989, the CG recognized that the technology of his sensor and weapon systems to engage deep targets had outpaced his ability to command and control these assets. He developed a deep operations team and integrated it into the FSC. The CG designated the corps artillery commander as the "deep division commander" and reorganized the corps FSE into a deep operations cell (DOC) within the FSC and an FSE cell within the corps plans cell. The DOC serves to emphasize the importance of deep operations and to facilitate the coordination and synchronization of planning and execution. Making deep operation work in the corps requires the full-time efforts of several people and staff sections. The deep operations team consists of a deep fires coordinator (DFC), Corps artillery current operations officer in charge (OIC), Corps artillery targeting officer, A2C2 (G3 air), ALO representative, Corps artillery G2, aviation regimental officer/S3, EW officer, ADE representative, and FAIO. All members are physically located in the FSC except the FAIO, who is located in the corps tactical operations center support element (CTOCSE) [the new doctrinal term is analysis and control element (ACE), not yet used by V Corps]. Available deep operations attack assets include ATACMS, BAI, attack helicopters, and EW, all placed under control of the corps artillery commander (as corps FSCOORD]) for planning and execution.

d. EEA 3. *What are the inputs and outputs of each C2 procedure, and what is the source of each input and who is/are the recipient(s) of each output?* The inputs/outputs for each task/subtask are contained in a "micro" flow diagram (appendix I) for the doctrinal case. The key to information contained in each diagram is found in figure 3-3. The micro diagrams have been organized into groups by which staff section (intelligence, FS, current operations, or plans) performs the task and phase (plan: mission analysis, estimate process, wargaming, or annexes/ OPLAN or execute: execution/evaluation, concept process, or plan/wargaming) the task is performed (figure 3-4). These task flow diagrams were developed to revise the C2NET analysis model of the deep operations C2 procedures "system." With the recognition of ADOCS providing a viable interim DOCC, these diagrams can be used to identify/locate candidate enhancements. ADOCS represents a start point for the development of a next-generation automated capability which will provide commanders at various levels near-real time planning, coordination, and execution means.

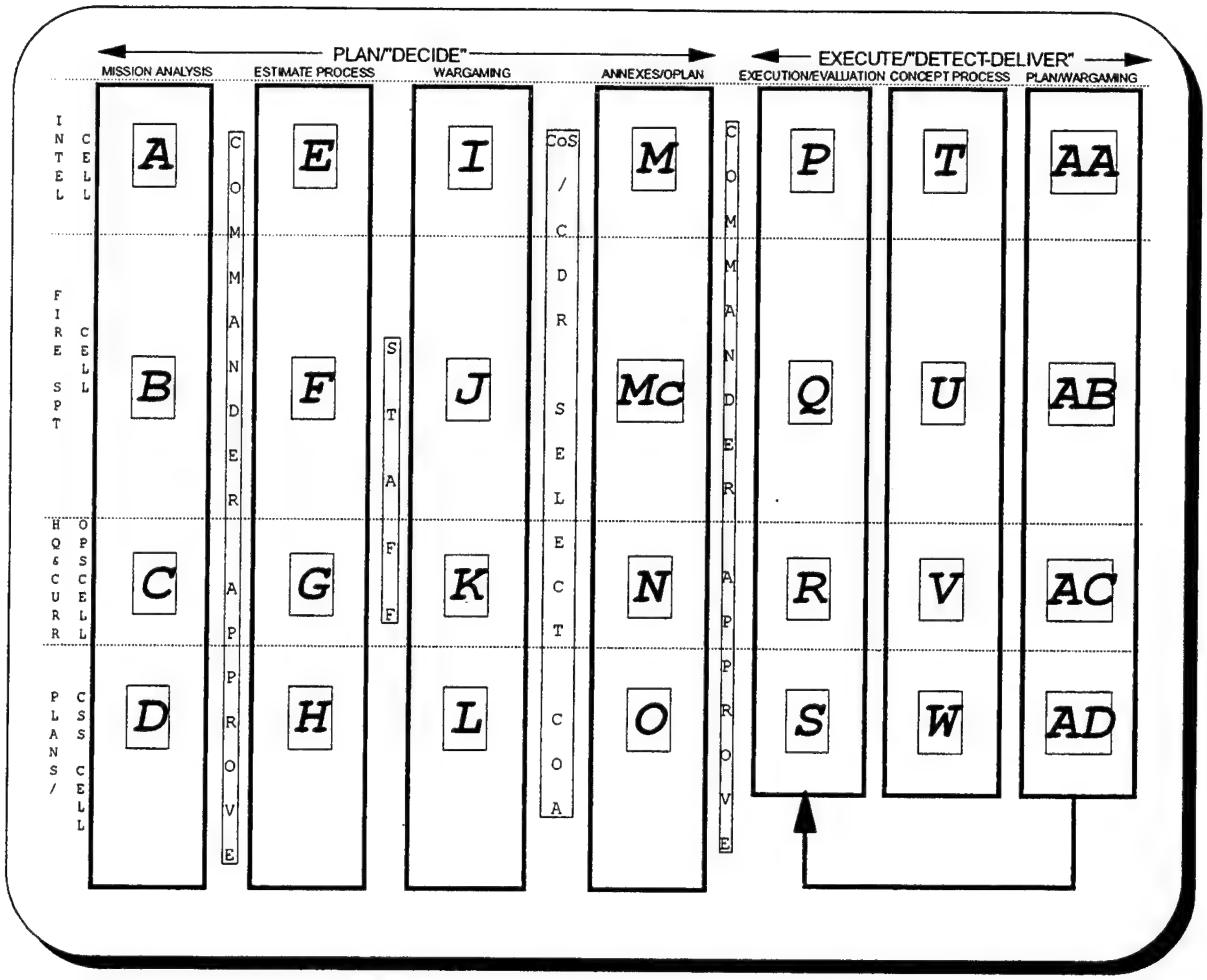

Figure 3-4. Grouping of tasks/subtasks

e. EEA 4. *What is the best structural network (the flows and "triggers" of tasks in series or parallel through the various staff sections/cells) to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?* The task flow diagrams display the four corps staff cells that perform deep operations planning and execution. The tasks/subtasks are grouped into the tactical decisionmaking process for planning and execution. Lines to represent the flow of tasks/subtasks are omitted for clarity.

(1) The doctrinal structural network "macro flow" diagram (appendix J) is based on corps ARTEP 100-15-MTP and CGSC Student Text 100-9, *The Tactical Decisionmaking Process.*

(2) The V Corps structural network "macro flow" diagram (appendix K) is based on the Deep Operations Annex of the V Corps Field SOP, April 1994, and observations made by the TRAC study team during the July 1994 CARAVAN GUARD CPX.

3-5. Conclusions. The following conclusions resulted from the functional analysis.

a. *Decide, detect, deliver methodology.* This methodology is valid for deep operations. However, because modern sensor systems have the capability to look beyond the corps' area of interest, it is not necessary or desirable to attack all targets immediately upon detection. Adding *track/decide* to the *detect* step has had positive results in battle command training program (BCTP) exercises and has been used and incorporated by corps in the field. Now the deep operations planners can coordinate and synchronize employment of deep attack weapon systems to maximize their lethality and to choose the time and place of attack to better support the close battle. *Assess* has been added to obtain and evaluate TDA to better plan, integrate, coordinate, and synchronize follow-on deep attacks.

b. EEA 1. *What C2 procedures (functions, processes, tasks, and subtasks) are required to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?* The C2 procedures (tasks at appendixes B, C, D, and E) were found to be common for the doctrinal and III and V Corps alternatives (all those examined) even though the organization of the staff structures is different. The validity of the tasks was confirmed during observations by the TRAC study team during the July 1994 V Corps CARAVAN GUARD field training exercise.

c. EEA 2. *Which staff sections perform deep operations C2 procedures (doctrine, V/III/ XVIII Corps).*

(1) Doctrinal structure (appendix F). The development of deep operations plans is integral to development of the OPLAN. The responsibility for development of the OPLAN belongs to the plans cell. Three other cells provide input: intelligence, FS, and current operations. There is no dedicated group of individuals to specifically develop a deep annex to the OPLAN.

(a) A *deficiency* found in the preliminary draft Corps Operation Tactics, Techniques, and Procedures (TTP) manual identifies the "ad hoc targeting cell technique is wasteful and ineffective because after the meeting, there is no central agent or staff element responsible for coordinating, integrating, and synchronizing guidance issued by the targeting cell." It further states that the solution to conducting effective deep operations on a continuous basis is the formation of a DOC at the corps main CP. The value of the DOC is to reduce the time involved from "sight to flight."

(b) The TTP further states that the DOC must have the authority from the commander to attack a deep target when detected by sensor without having to wait for approval. DOC must have positive control of and access to information generated by organic sensors employed against a deep target and direct access to deep targeting information generated by sensors employed by higher and flank units and national/strategic assets. Finally, the DOC must have positive control of organic attack assets earmarked for use in deep operations.

(c) Solutions. Within III and V Corps, the DOCs serve as central agents responsible for planning and executing operations at depth to support each corps. The DOC brings with it the automation (ADOCS, appendix L) necessary to reduce the horizontal processing times required

to coordinate and synchronize the employment of deep attack weapon systems. The V Corps CG has authorized the "deep division commander" (corps artillery commander - FSCOORD) to use corps assets to execute the deep battle in accordance with his (Corps commander's) intent and attack guidance. With the introduction of the collateral WARRIOR terminal, and, eventually, the Standard Army Command and Control System (STACCS), DOC has access to sensor information generated by theater and national assets. Additionally, with integration of corps targeting personnel, DOC has access to human intelligence (HUMINT). At the corps FSE, DOC coordinates with flank FSEs and, through them, division artilleries within the flanking corps to gain targeting information. Finally, as the corps artillery commander, the "deep division commander" has command of the corps ATACMS battalions. With the corps aviation brigade (CAB) commander physically present in the DOC, the FSCOORD can influence employment of attack aviation, as well as EW.

(2) III Corps structure (appendix G). III Corps has centralized the responsibility for deep operations planning in a deep operations planning cell and executing in the DOTC and the DOEC, the latter two cells both elements of the FSC. The corps artillery CG (as the Corps' FSCOORD) commands the corps artillery to support deep operations and integrates the many diverse and dynamic corps staff agencies to synchronize the planning, execution, and assessment of corps deep operations.

(a) The four major III Corps deep attack assets are corps aviation (the primary executor of deep attack operations), ATACMS (for high-priority targets and SEAD for attack helicopters), EW, and BAI. Because of Apache vulnerability during daylight, they are employed across the FLOT primarily between the hours of darkness (early evening nautical twilight (EENT) to before morning nautical twilight (BMNT)). The corps commander issues planning guidance to focus employment of deep attack assets, approves use of corps' deep attack assets and individual deep attack missions using Apaches, and makes "GO/NO GO" decisions on the launch of Apache deep strikes/attacks.

(b) The III Corps FSC is the focal point for planning, integration, and coordination for execution of deep operations. The corps G3 Air and G3 Aviation are included, as well as the ASOC, A2C2 element, ADE, EW and chemical, and corps artillery G2, G3 Operations, and signal officer. The DOTC (paragraph G-2c) consists of the AFSCOORD; corps deputy G3 Plans, G3 air, G3 aviation, G3 deception, G2 targeting, G2 collection manager, A2C2 element, EW, special operations coordinator (SOCOORD), ALO, psychological operations (PSYOP), staff judge advocate (SJA), G5/Civil Affairs, FSE targeting officer(s), FSE FAIOs, chemical, engineer; and 6th Cavalry and division liaison officers (LNO). The DOEC (paragraph G-2d) consists of the corps artillery CG/DCO, commander/S3 - 6th Cavalry Brigade, senior FSE shift officer, G3 aviation, A2C2 element, EW, ALO, FSE FAIO, and division LNOs. A series of meetings (paragraph G-4) and the newly-acquired (from V Corps) ADOCS (appendix L) provide the means for streamlining the coordination and synchronization of deep operations planning and execution.

(3) V Corps structure (appendix H). V Corps has centralized the responsibility for planning and executing deep operations in the corps FSC. The corps CG has provided unity of deep operations command by establishing a permanent, dedicated DOC within the FSC. The DOC

serves to emphasize the importance of deep operations and to facilitate the coordination and synchronization of planning and execution.

(a) The four major V Corps deep attack assets are corps aviation (Apaches, the focal point of deep attack operations), ATACMS, EW, and BAI. Because of Apache vulnerability during daylight, they are employed primarily across the FLOT only between the hours of darkness (EENT to BMNT). During the July 1994 CARAVAN GUARD CPX, the priority of Apache (deep operations) targets was army artillery groups/army group rocket artillery and heavy armor. ATACMS was used primarily for SEAD to lead the Apaches as they ingressed and egressed between the FLOT and their engagement areas. Air Force EW was normally not available to Army aviation; when possible, timing of Apache flight routes was leveraged to take advantage of planned Air Force EW. BAI and ATACMS were the only daylight attack assets (neither were very effective for heavy armored or moving targets).

(b) The V Corps FSC has been organized to maximize Apache deep attack operations. The corps attack aviation officer and staff are included, as well as the ALO, the corps A2C2 section, the corps ADE, and LNOs from corps FA brigades, division and adjacent corps artilleries, corps engineer, SOF, and long-range surveillance unit (LRSU). The DOC (paragraph H-2c(1)) has been added to, and is the focal point of, the FSC. The DOC includes a deep fires coordinator (DFC); the corps artillery G2, a noncommissioned officer (NCO), a WARRIOR terminal operator; and three targeting officers. A series of meetings (paragraph H-4) and the ADOCS (appendix L) provide the means for streamlining the coordination and synchronization of deep operations planning and execution. The DOC and ADOCS have significantly improved the horizontal processing of targets within the FSC. Crucial man hours for planning and coordination (often lost in major time delays that were a product of a bureaucratic auditing process, excessive amounts of paperwork, and general confusion among the segregated members of the FSC) have been saved.

d. EEA 3. *What are the inputs and outputs of each C2 procedure, and what is the source of each input and who is/are the recipient(s) of each output?* The input/output "flow" diagrams (appendix I) reflect the TRAC study team's understanding of the doctrinal flow of tasks inherent in planning and executing deep attack operations. These diagrams were used to modify C2NET to represent the doctrinal flow of tasks. It was deemed redundant to produce a separate set of micro flow diagrams to develop a V Corps model. We believe this to be a minor effort because the processes are similar; it is only the sequence and who performs the tasks that are different. Additionally, direct observation of V Corps planning and coordination revealed that the level of detail in the doctrinal effort may not be necessary for modeling or analysis and developing or enhancing existing automated systems.

e. EEA 4. *What is the best structural network (the flows and "triggers" of tasks in series or parallel through the various staff sections/cells) to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?* The DDP is useful and applicable when time permits, as during the air campaign of Desert Storm. The land component commander had weeks to prepare his OPLAN prior to the start of the ground campaign. However, once it began, the tempo was so rapid and the duration so short,

there were limited opportunities to use the DDP again. Instead, the CDP was used to quickly assess the situation to rapidly develop warning and fragmentary orders.

(1) Doctrinal network. This network (appendix J) represents the "doctrinal" flow of tasks through the corps staff sections that perform deep operations C2 procedures. The network is organized by the planning (figure J-1a) and execution (figure J-1b) functions. Each function is decomposed into phases as found in the tactical decisionmaking process of CGSC Student Text 100-9. A condensed version of execution function (figure J-1b) is found on figure J-2. This condensed version was used in the computer model and is at a similar level of detail to the DOCC model found in appendix K and as used in the DOCC computer model.

(2) V Corps ("DOCC") network. This network (Appendix K) represents the "DOCC" flow of tasks as they are performed in V Corps staff sections that perform deep operations execution C2 functions. This task flow was used in the DOCC computer for the comparative analysis with the doctrinal network and flow and for the beginning point for the "experiments" with the DOCC computer model.

(3) Comparison of doctrinal and DOCC networks. Primary differences in the two networks are where (which staff section) ten specific tasks were performed and the quantity of personnel in various staff sections. The quantity of personnel for the doctrinal model was used from FMs, assuming 50 percent of the staff was on duty each of two 12-hour shifts. The DOCC model quantities were observed and collected during the July 1994 CARAVAN GUARD exercise, where 50 percent of the staff was on duty each of two 12-hour shifts. The differences in where ten tasks were performed are described in table 3-1 (the remaining tasks were performed in the identical locations with the same times in the two alternatives). One of the reasons the DOCC model outperformed the doctrinal model is that numerous tasks have been moved from the plans cell to various other cells. This has reduced bottlenecks that had been occurring at the plans cell during the execution segment of deep operations.

Table 3-1. Task to staff sections comparison

Tasks Performed	Doctrinal Staff Section	DOCC Staff Section
E.A.1.1 Monitor Enemy Activity in Corps AoI IAW G2	Plans Cell	DOC
P.C.3 Plan AD Ops	Plans Cell	FSC
P.C.6 Plan AVN Employment	Plans Cell	FSC
P.C.9 Plan FS Assets	Plans Cell	FSC
P.C.15.4 Plan Intel Ops	Plans Cell	Corps Arty G2
S.B.4 Synch FS Ops	Plans Cell	FSC
E.A.1.2 Rec Deep Atk CONPLAN	Plans Cell	FSC
E.A.1.3 Implement CDR's decision for Deep Attack	Corps Current Ops Cell	DOC
E.A.1.4 Assess Deep Ops Results	Corps Current Ops Cell	DOC
P.B.2.5 Provide Intel support to Targeting	CM&D	FAIO

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DEEP OPERATIONS COORDINATION CELL (DOCC) ANALYSIS
CHAPTER 4
PERFORMANCE ANALYSIS

4-1. Introduction. The purpose of the performance analysis was twofold. The first was to make comparative assessments between the doctrinal alternative of performing deep operations C2 procedures and the DOCC alternative. The second was to evaluate modifications to the DOCC alternative to determine an optimal configuration. To accomplish this, models of the two different alternatives were developed and used to generate MOP to address the following EEA.

4-2. EEA and MOP.

a. The following EEAs were addressed by the performance analysis.

(1) EEA 5. *What is the optimum composition and manning level for a DOCC to make deep operations C2 procedures more efficient in terms of timeliness and effectiveness?*

(2) EEA 6. *How can planning and executing timelines be reduced using a DOCC? How can the procedures be grouped and automated to reduce bottlenecks, stale messages, and timeliness?*

(3) EEA 7. *Which enhancements yield the most efficient DOCC and employ deep attack weapons/systems most effectively?*

b. The following MOPs were generated by the models and used to support the performance analysis of each alternative.

(1) MOP 1. *Overall processing time,* defined as the time to perform the longest planning, coordinating, synchronizing, and executing tasks within the corps main command post. This "long-path" time is equal to the sum of the times required to conduct the individual tasks, plus the sum of the time that a message or target nomination must wait at a staff section to be processed.

(2) MOP 2. *Number of "bottlenecks,"* defined as the number of times a particular task has a message or target nomination become stale while awaiting processing. When messages and target nominations are presented to a staff section for processing, they will remain in queue if appropriate personnel are not available. Messages and target nominations become "stale" when their time in queue exceeds their "no later than" time for execution. Messages used as inputs for planning tasks do not have explicit "cut-off" times and, therefore, cannot become stale. The following specific statistics support the identification of bottlenecks.

(a) Average size of queue, defined as the number of messages or target nominations per each task that are in queue at any time during the model run.

(b) Total processing time for a message or target nomination. Total time equals to task processing. time plus queue time.

(c) Average number of target nominations that become stale in the execution cycle.

(3) MOP 3. *Efficiencies,* defined as successful message or target nomination processing and utilization rate of each staff section. The following specific statistics support the identification of efficiencies.

(a) *Percent of target nominations processed,* defined as the number of target nominations that are successfully processed for execution divided by the total number of target nominations received for processing. [The difference between the two is the number of target nominations that become stale while awaiting processing.]

(b) *Staff utilization rate*, defined as the average percent of each staff section that is busy over the simulation run time.

4-3. Performance analysis approach. The performance analysis approach implemented to address the above EEAs is illustrated in figure 4-1 and described as follows.

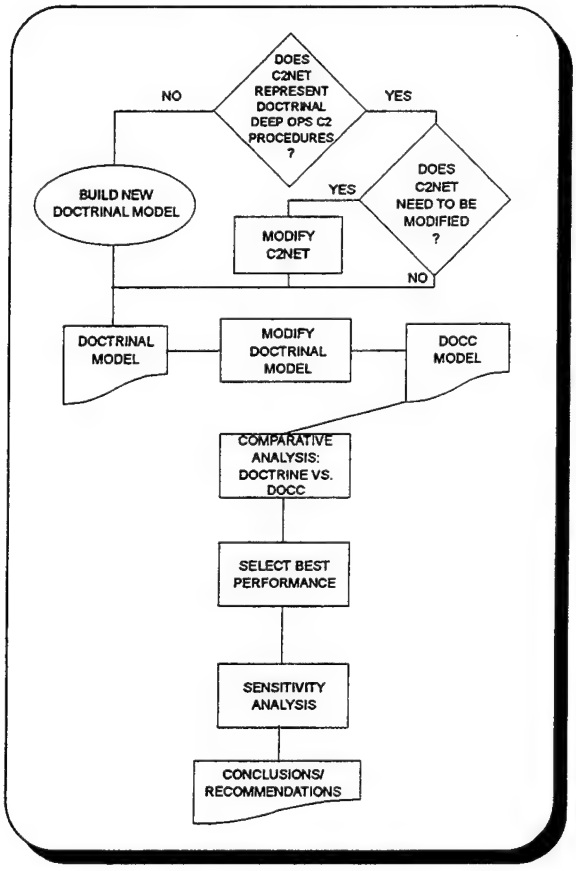


Figure 4-1. Performance analysis approach

a. The existing C2NET model was reviewed to determine how well it represented doctrinal deep operations C2 structures/procedures and whether it could be used for this analysis, or if modifications were required. As a result of the review, C2NET was determined to adequately represent the doctrinal alternative with minor modifications.

b. C2NET was then modified to represent the DOCC alternative to the doctrinal structure/ procedures. This alternative was based on the organizational structures and deep operations C2 procedures as reflected in the III Corps Artillery Tactical SOP and the Deep Operations Annex of the V Corps field SOP. The alternative reflected field modifications to doctrine.

c. The alternatives were run in the appropriate model and were analyzed to identify potential critical paths and bottlenecks in the processing of deep operations C2 tasks and procedures. Both alternatives were examined in terms of how well they perform the tasks necessary to both plan and execute deep operations.

d. The better alternative was determined and used to conduct a sensitivity analysis of additional alternatives to support recommendations on DOCC staff configurations and groupings of deep operations C2 procedures to further enhance timeliness and effectiveness.

4-4. Assumptions. The following assumptions were used for the performance analysis.

a. Deep operations C2 tasks are performed within the corps main CP.

b. The C2FAM database, which is used in C2NET, is reasonable and acceptable for use in C2 modeling and analysis.

c. Data obtained from the July 1994 V Corps CARAVAN GUARD CPX is an accurate representation of the time required to perform deep operations C2 tasks for a corps headquarters that uses a DOCC and ADOCS.

d. Unit TO&E and personnel strength levels are fixed and cannot be increased within the Corps CP.

4-5. Alternatives. The doctrinal and DOCC alternatives were developed by identifying the key functions and tasks performed within the corps main CP as determined from the literature search referenced in chapter 3. These tasks were mapped to organizational structures of the CP, such as the plans cell and FSC. The horizontal flow of information among the staff sections was determined and represented in the computer model of each alternative. The resolution for both alternatives is the individual staff sections within the corps main CP. Table 4-1 lists the key tasks modeled in each alternative.

a. Doctrinal alternative. This alternative was developed and modeled using C2NET (appendix M) as a start point. It was modified to more explicitly represent deep operations C2 procedures in accordance with FMs 100-15-1 and 6-20-10 and CGSC Student Text 100-9. Figure 4-2 depicts the flow of the tasks represented in the doctrinal alternative (also see appendix J).

b. DOCC alternative. Variations to the doctrinal alternative were determined and modeled to create the DOCC alternative. It represents the deep operations planning and execution procedures with a DOCC integrated into the corps main CP. The variations with the doctrinal alternative were determined by a literature search of III and V Corps field SOPs and direct observation of the V Corps FSC operations during CARAVAN GUARD 94. The primary difference between the alternatives is the merging of the corps artillery headquarters with the corps FSE to create a corps DOCC within the FSC. The DOCC has the responsibility to plan deep operations contingencies, coordinate and synchronize the efforts of the deep operations team to develop specific deep attack CONPLANs, and directly supervise the execution of approved deep attack CONPLANs. The DOCC alternative differs from doctrine in that specific key tasks were moved from the corps plans cell to the FSC and DOCC. Additionally, the data used for the performance of key tasks in the execution cycle was collected from CARAVAN GUARD 94 and reflects the use of ADOCS- and DOCC-induced changes to the horizontal flow of information among staff sections within the FSC (Figure 4-3 and appendix K).

Table 4-1. Key tasks list

Key Task		Staff Section that performs the task	
Task #	**Description**	**Doctrinal Alternative**	**DOCC Alternative**
P.B.1.4	Threat Evaluation	G2 Tgts- Intel Cell	G2 Tgts- Intel Cell
P.B.1.5	Threat Integration	"	"
P.B.2.3	Analyze Cmbt Intel & Info	"	"
P.B.2.5	Provide Intel Spt to Tgting	"	"
P.C.3	Plan AD Opns	ADE Plans Cell	AD Sec - FSC
P.C.4	Dev & Coord A2C2 Plans	G3 Air/A2C2 -FSC	A2C2 Sec - FSC
P.C.5	Dev Priorities for AI/BAI	ALO/ASOC - FSC	ALO/ASOC - FSC
P.C.6	Plan Avn Employment	Avn Plans	AVN Bde - FSC
P.C.8	Plan EW	EW Sec - FSC	C/A G2 - DOCC
P.C.9	Plan FS Assets	FSE	DFC/TGT Analysts - DOCC
P.C.15.4	Plan Intel Ops	G2 Plans	C/A G2 - DOCC
C.A.6	ID & Resolve Airspace Conflicts	G3 Air/A2C2 - FSC	A2C2 - FSC
C.B.7	Coord Avn Empl w/ Fires	Avn Bde	Avn Bde/Tgt Analysts - FSC
S.A.1.3	Update Collection Plan	ASPS - Intel Cell	ASPS - Intel Cell
S.B.3	Sync Joint Air Spt Ops	G3 Air/A2C2 - FSC	A2C2 - FSC
S.B.4	Sync FS Ops	FSE	DFC/FSCOORD - DOCC
E.A.1.1	Monitor Enemy Activity in Corps AOI IAW G2	G3 Plans	FSCOORD, DFC, AVN CDR, ALO, C/A G2 - DOCC
E.A.1.2	Dev & Recommend Deep Attack Plan	G3 Plans	"
E.A.1.3	Implement CDR's decision for Deep Attack	G3 Opns	FSCOORD, DFC - DOCC
E.A.1.4	Assess Deep Ops Results	G3 Opns	FSCOORD, DFC
E.A.6	Process Tgt Attack	FSE	TGT Analysts - DOCC
E.A.7.1	Coord Tgt Attack	Not modeled	C/A G3
E.A.7.2	Xmit to Attack Assets	Not modeled	C/A G3

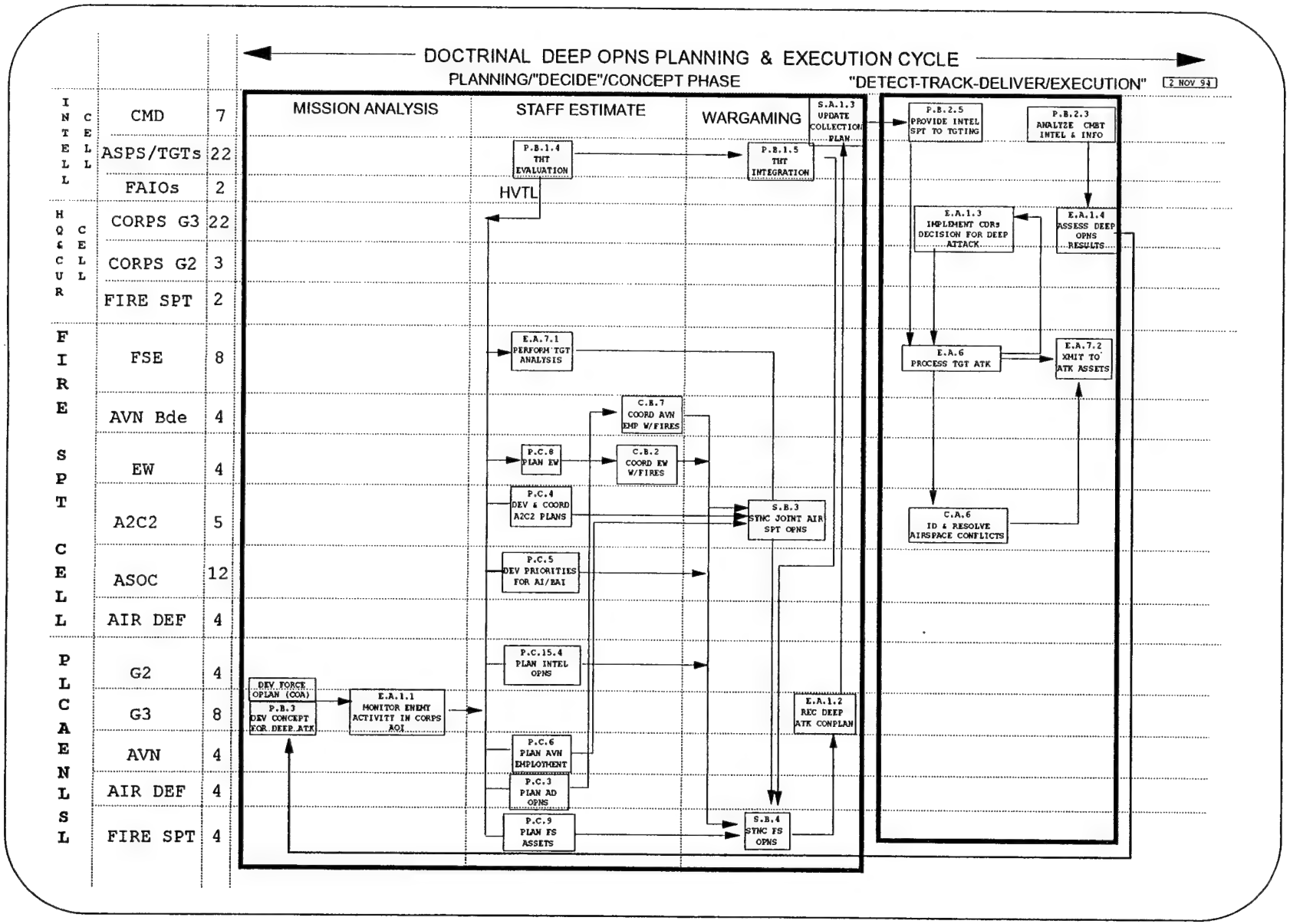


Figure 4-2. Doctrinal alternative task flow

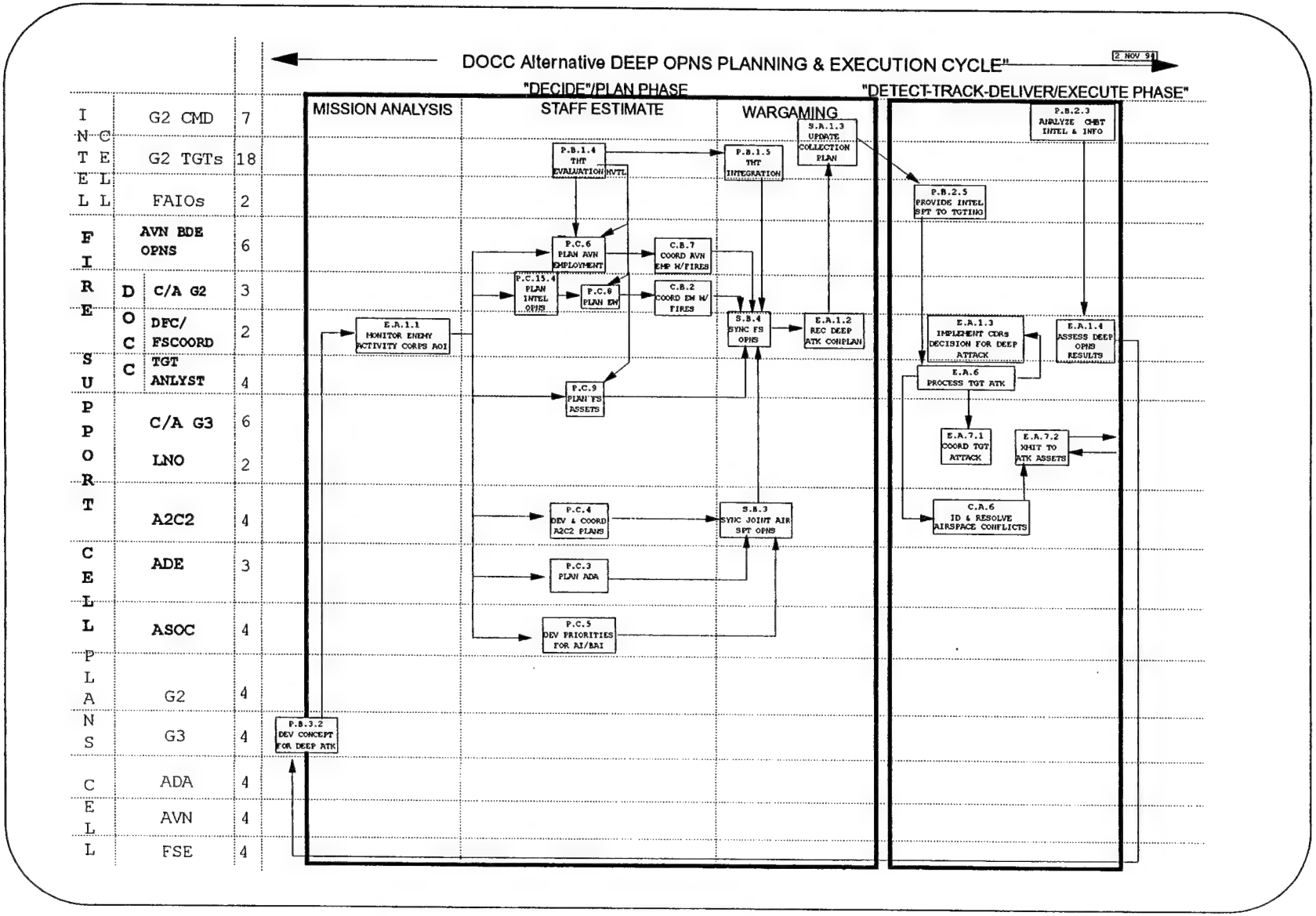


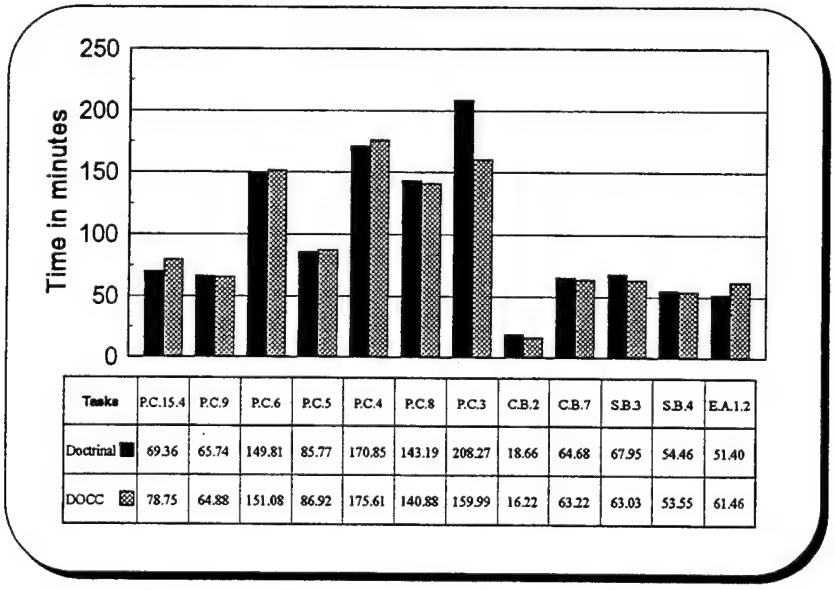
Figure 4-3. DOCC alternative task flow

4-6. Performance analysis results, doctrinal versus DOCC. The following results, organized by MOP, were obtained from the performance analysis of comparisons between the doctrinal and DOCC alternatives. The alternatives were run for the equivalent of 20 days with both planning and execution cycles running concurrently to simulate multiple and continuous tasking of appropriate staff sections. The frequency at which each cycle was initiated was based on data obtained from CARAVAN GUARD 94. Those tasks in both the planning and execution cycles that are by definition subjective (i.e., E.A.1.4, *Assess Deep Operations Results*) or based on nondiscrete continuous input (i.e., E.A.1.1, *Monitor Enemy Activity in Corps AOI*) were not evaluated.

a. MOP 1 - overall processing time. The overall processing time for both the planning and execution cycles reflect both the average processing time and time in queue for those messages or target nominations that complete each process. The individual task statistics reflect the average processing time of all targets and messages input to that task, regardless of whether they become stale at a subsequent task.

(1) Planning cycle.

(a) Deep operations tasks. DOCC had similar or faster average processing times for each of the planning tasks evaluated (figure 4-4). Improvements in processing times were the result of modifying both the structure of staff organizations within the FSC and the flow of deep attack planning and coordinating tasks.

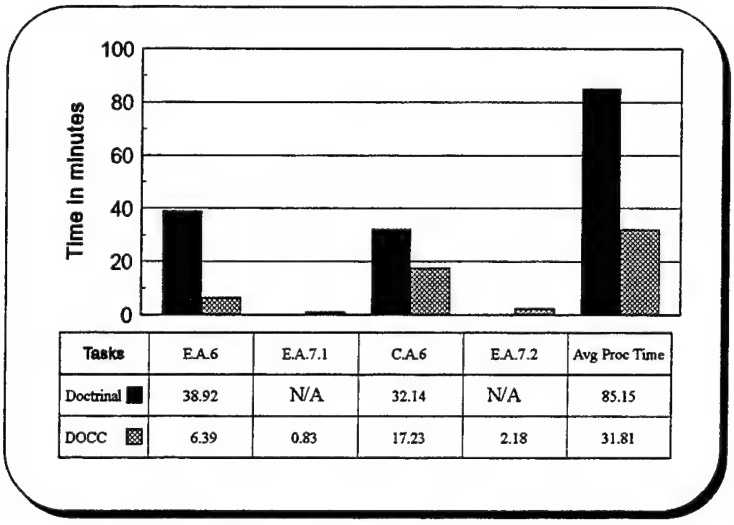


Tasks	P.C.15.4	P.C.9	P.C.6	P.C.5	P.C.4	P.C.8	P.C.3	C.B.2	C.B.7	S.B.3	S.B.4	E.A.1.2
Doctrinal	69.36	65.74	149.81	85.77	170.85	143.19	208.27	18.66	64.68	67.95	54.46	51.40
DOCC	78.75	64.88	151.08	86.92	175.61	140.88	159.99	16.22	63.22	63.03	53.55	61.46

Figure 4-4. MOP 1 - processing times, planning cycle

(b) Overall time. The overall processing time is equal to the sum of the processing times for the tasks in figure 4-4, additional tasks outside the deep operations focus (not explicitly modeled), and queue times. Since tasks are performed both in parallel and in series, the individual task times do not sum to the overall processing time. On average, the overall processing time for deep operations planning tasks was 1,452 minutes for the doctrinal alternative and 948 minutes for the DOCC alternative. The primary reason for the greater time in the doctrinal alternative is that it

requires development of staff estimates and selection of a course of action (COA) prior to develop of a deep operations plan (figure 4-2), whereas in the DOCC alternative planning begins with the receipt of the commander's concept for deep operations and is augmented with staff estimates as they are completed.



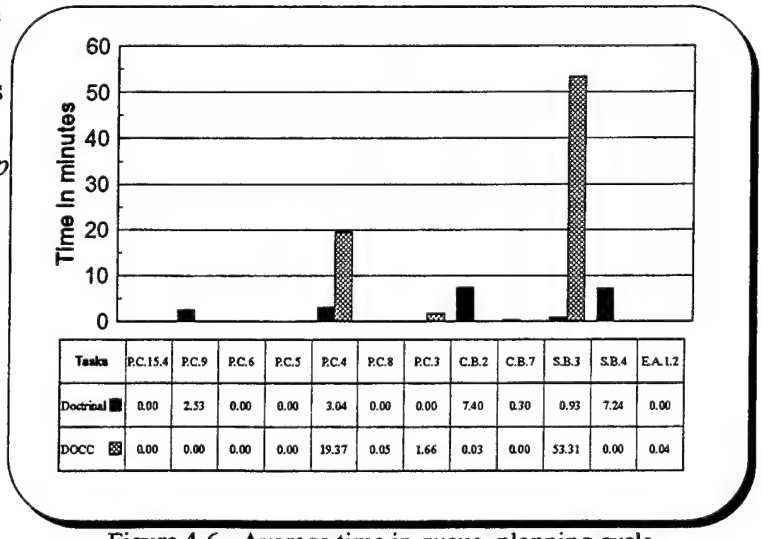
Tasks	E.A.6	E.A.7.1	C.A.6	E.A.7.2	Avg Proc Time
Doctrinal	38.92	N/A	32.14	N/A	85.15
DOCC	6.39	0.83	17.23	2.18	31.81

Figure 4-5. MOP 1 - processing times, execution cycle

(2) Execution cycle (figure 4-5). For the execution cycle, the DOCC alternative was faster than the doctrinal alternative for every task evaluated. The tasks with the longest processing time in the doctrinal alternative was E.A.6, *Process TGT Attack,* with an average processing time of 38.92 minutes (6.39 minutes in the DOCC model). The longest processing time in the DOCC alternative was C.A.6, *ID & Resolve Airspace Conflicts,* with an average processing time of 17.23 minutes (32.14 minutes in the doctrinal model). The average time to complete the execution processing per target was 85.15 minutes for the doctrinal alternative and 31.81 minutes in the DOCC alternative. The improved processing times for all tasks in the DOCC alternative is directly attributable to the use of ADOCS and other automation (WARRIOR and MCS) to expedite the horizontal processing of targets within the DOCC and other staff sections in the FSC.

b. MOP 2 - bottlenecks. Bottlenecks are those tasks at which messages and target nominations become stale while waiting in queue to be processed.

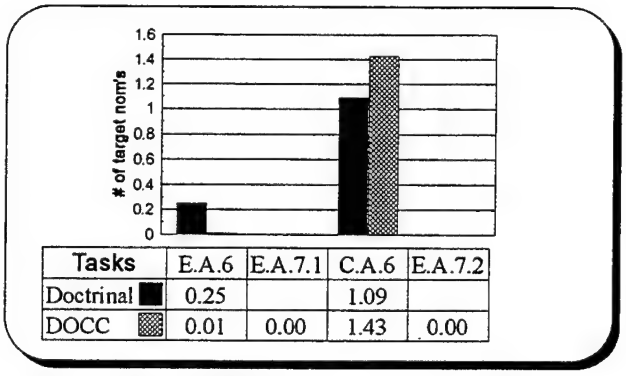
(1) Planning cycle (figure 4-6). The planning cycle does not experience stale messages since these tasks do not have cut-off times for the processing of information. A more revealing statistic for the planning cycle, therefore, is the time that information must wait in queue to be processed. The only tasks in the planning cycle that had significant queues were P.C.4, *Develop and Coord A2C2 Plans, and* S.B.3, *Sync Joint Air Spt Opns*. Both tasks are performed in the A2C2 staff section in each alternative. Planning messages must wait in queue while the staff section processes target nominations for the execution cycle. Figure 4-6 depicts the average time in queue for these messages.



Tasks	P.C.15.4	P.C.9	P.C.6	P.C.5	P.C.4	P.C.8	P.C.3	C.B.2	C.B.7	S.B.3	S.B.4	E.A.1.2
Doctrinal	0.00	2.53	0.00	0.00	3.04	0.00	0.00	7.40	0.30	0.93	7.24	0.00
DOCC	0.00	0.00	0.00	0.00	19.37	0.05	1.66	0.03	0.00	53.31	0.00	0.04

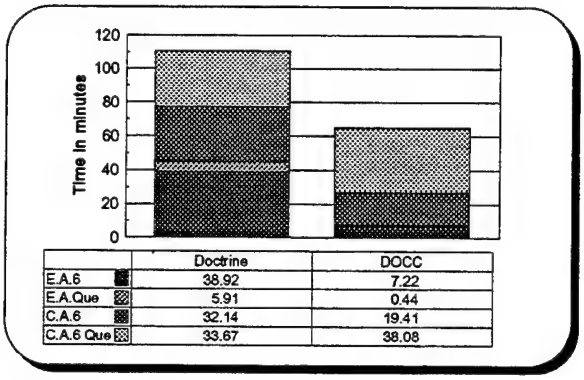
Figure 4-6. Average time in queue, planning cycle

(2) Execution cycle. The execution cycle developed queues in the A2C2 section for both alternatives. In the DOCC alternative, task C.A.6, *ID & Resolve Airspace Conflicts,* held an average of 1.43 target nominations (figure 4-7a) in queue for 38.08 minutes (figure 4-7b), compared to only 1.09 target nominations for 33.67 minutes for the doctrinal alternative. Total processing time for the doctrinal alternative was 110.64 minutes and 61.64 minutes for the DOCC alternative.



Tasks	E.A.6	E.A.7.1	C.A.6	E.A.7.2
Doctrinal	0.25		1.09	
DOCC	0.01	0.00	1.43	0.00

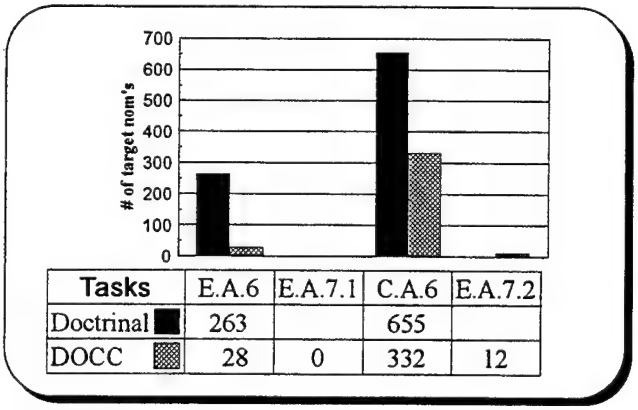
Figure 4-7a. MOP 2a - average number of target nominations in queue, execution cycle



	Doctrine	DOCC
E.A.6	38.92	7.22
E.A.Que	5.91	0.44
C.A.6	32.14	19.41
C.A.6 Que	33.67	38.08

Figure 4-7b. MOP 2b - total processing time (task + queue times), execution cycle

(a) Ninety percent (332 of 372) of the DOCC alternative target nominations that become stale did so during A2C2 processing (figure 4-7c).

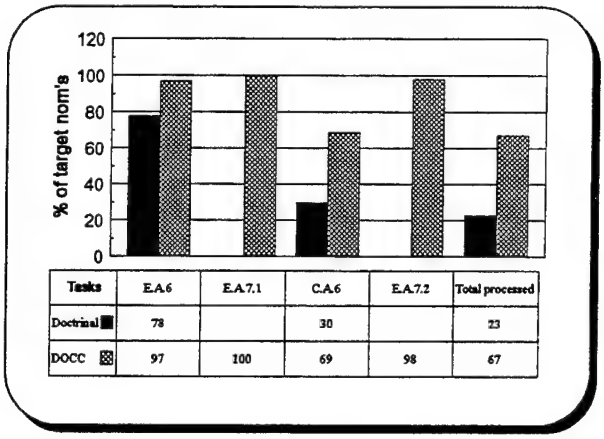


Tasks	E.A.6	E.A.7.1	C.A.6	E.A.7.2
Doctrinal	263		655	
DOCC	28	0	332	12

Figure 4-7c. MOP 2c - average number of stale target nominations, execution cycle

(b) Part of the reason for larger queues (figure 4-7a), longer queue times (figure 4-7b), and a preponderance of stale target nominations (figure 4-7c) for task C.A.6 is that A2C2 tasks were performed as a final step in clearing targets to be attacked. In the DOCC alternative, ADOCS is used to shorten the processing time of the tasks preceding those that are performed by the A2C2 section. Although the A2C2 section used ADOCS to receive target nominations and transmit cleared ones, the actual mechanics of coordinating and clearing a nomination and deconflicting airspace is still performed manually. Consequently, target nominations were presented to the A2C2 section at a rate faster than they could be processed, increasing the likelihood of becoming stale.

c. MOP 3 - efficiencies. The efficiencies statistics refer to both the number and percent of target nominations processed and the personnel utilization rate for each staff pool.



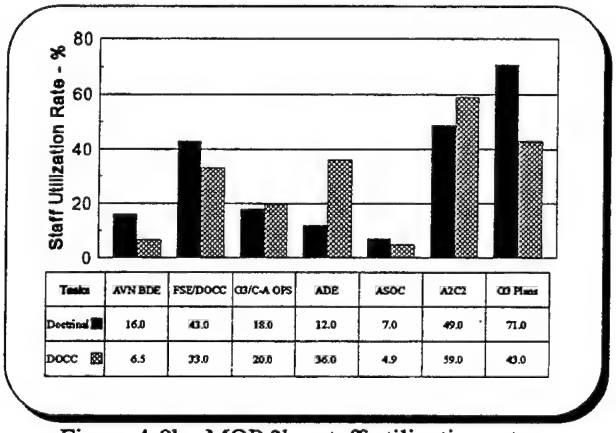
Tasks	E.A.6	E.A.7.1	C.A.6	E.A.7.2	Total processed
Doctrinal	78		30		23
DOCC	97	100	69	98	67

Figure 4-8a. MOP 3a - percent target nominations processed

d. The DOCC alternative processed a greater percent of the available target nominations than the doctrinal alternative for each task considered (figure 4-8a). The primary reason is the use of ADOCS automation to reduce the horizontal task processing times within the corps CP. (Processing times include the time to transfer information from one staff section to the next, queue time, and the actual time to process the task.) Reducing the processing time for individual tasks, and the time required to coordinate the information within the CP, increased the percent of target nominations that were processed and ultimately executed.

(1) The staff sections in the DOCC alternative generally had lower staff utilization rates because of automation and the fact that DOCC only processed deep attack operations messages and information (figure 4-8b). The DOCC alternative A2C2 section had a higher utilization rate than the doctrinal alternative because the DOCC processed and passed to the A2C2 section a greater percent of target nominations. This resulted in significant bottlenecks in the A2C2 section. Similarly, the ADE section has a higher utilization rate compared to the doctrinal alternative because this staff section must interact with the A2C2 section to deconflict target nominations.

(2) An additional effect of DOCC operations can be seen in the G3 plans section. Shifting deep operations planning tasks from the G3 plans section (to the DOCC) reduced its staff utilization rate from 71 percent to 43 percent.

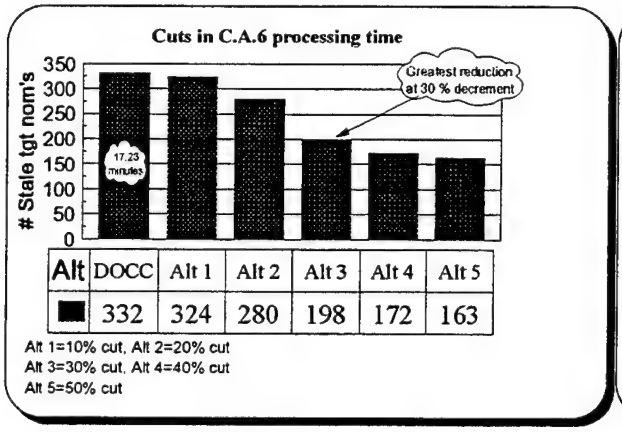


Tasks	AVN BDE	FSE/DOCC	G3/C-A OPS	ADE	ASOC	A2C2	G3 Plans
Doctrinal	16.0	43.0	18.0	12.0	7.0	49.0	71.0
DOCC	6.5	33.0	20.0	36.0	4.9	59.0	43.0

Figure 4-8b. MOP 3b - staff utilization rates

e. Summary. The DOCC alternative had faster overall processing times for both the planning and execution cycles and fewer bottlenecks (stale target nominations). Both alternatives had bottlenecks in the A2C2 staff section in the execution cycle. The size of the queue in the DOCC for task C.A.6 was larger (average of 1.43 targets in queue compared to 1.09 for doctrine) and the length of time target nominations were in queue was longer (38.08 minutes compared to 33.67 minutes for doctrine) because a greater number of target nominations passed through the system and queued at the task with the longest processing time. The DOCC had fewer target nominations become stale and processed more targets overall (67 percent compared to 23 percent for the doctrinal alternative) because of a shorter processing time for task *C.A.6, ID & Resolve Airspace Conflicts* compared to doctrine. The reason for the improved performance of the DOCC alternative was the use of ADOCS and other automation (WARRIOR and MCS) to reduce the horizontal processing time of targets and messages within the FSC and DOCC.

4-7. Performance analysis results, DOCC sensitivity analysis. Initial analysis indicated that the greatest improvement in performance was the result of using automation to reduce task processing times and that the A2C2 staff section offers the greatest opportunity for improvement. Although the A2C2 staff section used ADOCS to send and receive target nominations and information, the coordination of targets with aerial assets and clearing of airspace is still primarily a manual process. To determine the potential for continued improvements in performance, the processing time for task C.A.6, *ID & Resolve Airspace Conflicts,* was reduced in 10 percent decrements and the DOCC simulation was rerun. The time reductions simulate potential enhancements in automation to better support the A2C2 section. The results of the five new alternatives considered are listed in figures 4-9a and b below.



Alt	DOCC	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
■	332	324	280	198	172	163

Figure 4-9a. MOP 2c - number of stale targets nominations, alternatives 1-5

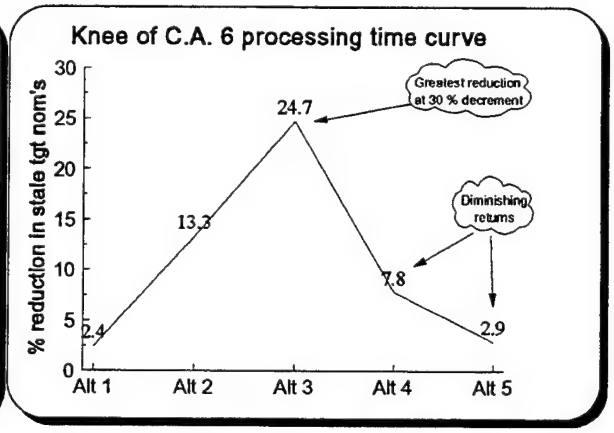


Figure 4-9b. Rate of reduction in stale target nominations, alternatives 1-5

a. As expected, each alternative resulted in a decrease in the total number of targets that became stale. The greatest reduction in stale targets occurs with alternative 3, a 30 percent reduction in processing time (figure 4-9a). The greatest rate of reduction from the 10 percent decrements also occurred at alternative 3, as a point of diminishing returns appears to occur at that point. Therefore, alternative 3 was evaluated against the DOCC alternative for each measure of performance. The results of this comparison are depicted in figures 4-10, 4-11, and 4-12, below. Average processing times for the other tasks in the execution cycle were not affected.

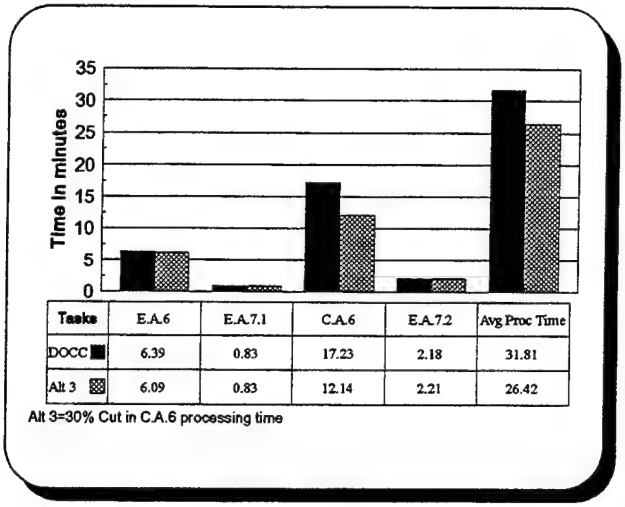


Figure 4-10. MOP 1 - processing times, DOCC and alternative 3

b. MOP 1 - processing time (figure 4-10). Alternative 3 reduced the average processing time for the execution cycle by 17 percent (26.42 minutes from 31.81 minutes).

c. MOP 2 - bottlenecks. Alternative 3 reduced the size of the queue (figure 4-11a), the average time that a target nomination waited to be processed (figure 4-11b), and total processing time (DOCC = 61.64 minutes and Alt 3 = 45.48 minutes). However, the bottleneck at the A2C2 section is still significant (figure 4-11c); 83 percent of all nominations that go stale do so at the A2C2 section).

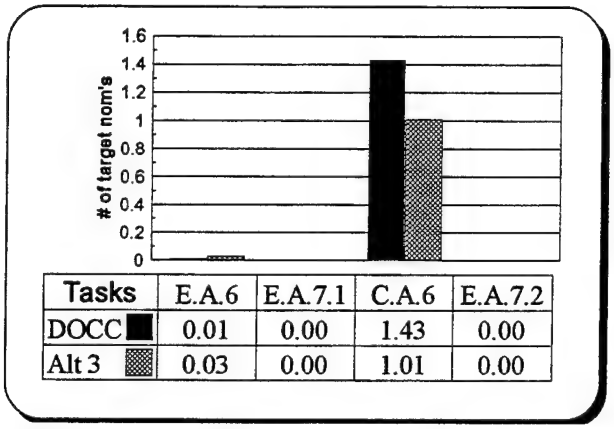


Figure 4-11a. MOP 2a - average number of target nominations in queue, DOCC and alternative 3

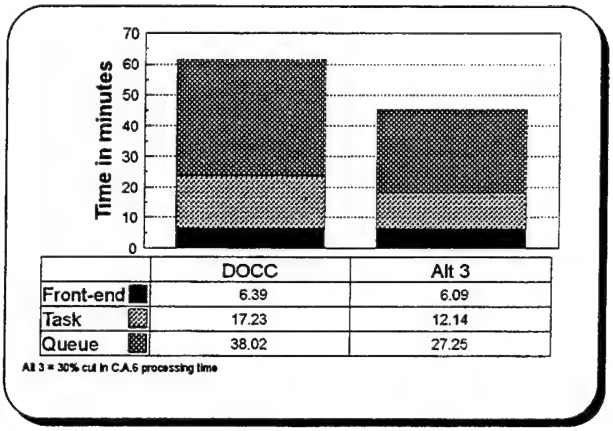


Figure 4-11b. MOP 2b - total processing time, DOCC and alternative 3

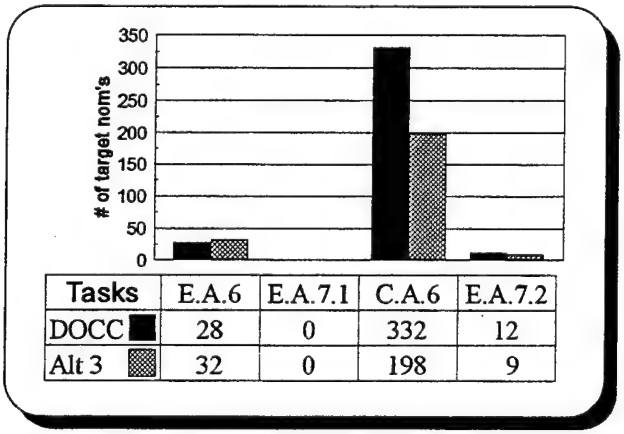
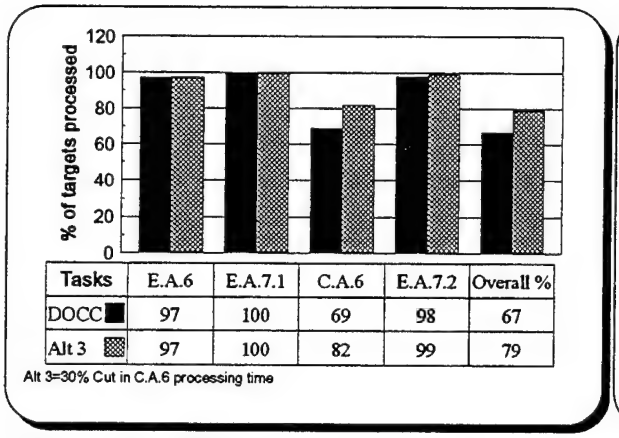


Figure 4-11c. MOP 2c - number of stale target nominations, DOCC and alternative 3

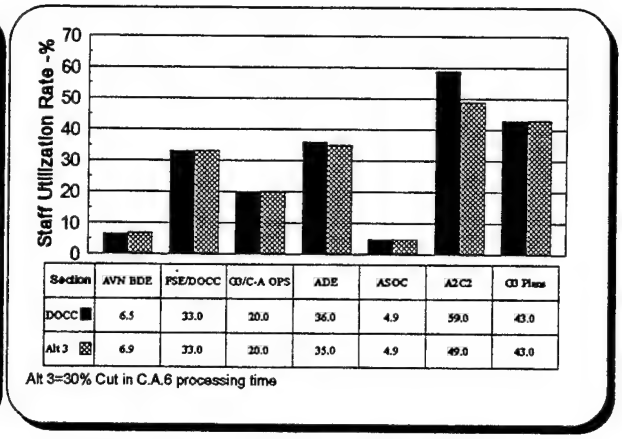
d. MOP 3 - efficiencies. Alternative 3 processed a greater percent of the targets nominated (increase from 67 percent to 79 percent) compared to the "base" DOCC alternative (figure 4-12a). The utilization rate for the A2C2 section was reduced from 59 to 49 percent because of the shorter processing time for task C.A.6 (figure 4-12b). The A2C2 section, therefore, processed more targets with the staff working less.



Tasks	E.A.6	E.A.7.1	C.A.6	E.A.7.2	Overall %
DOCC	97	100	69	98	67
Alt 3	97	100	82	99	79

Alt 3=30% Cut in C.A.6 processing time

Figure 4-12a. MOP 3a - percent of target nominations processed, DOCC and alternative 3

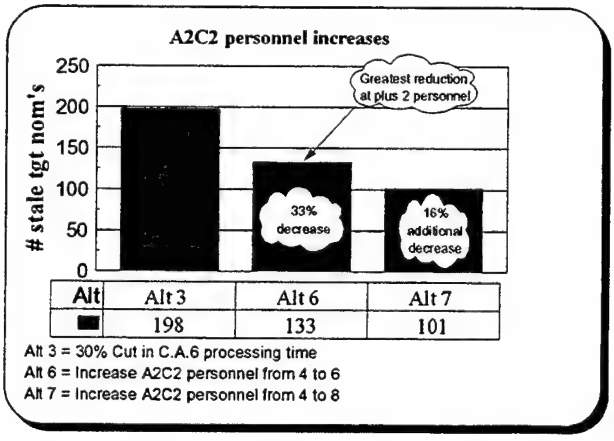


Section	AVN BDE	PSE/DOCC	CO/C-A OPS	ADE	ASOC	A2C2	CO Plans
DOCC	6.5	33.0	20.0	36.0	4.9	59.0	43.0
Alt 3	6.9	33.0	20.0	35.0	4.9	49.0	43.0

Alt 3=30% Cut in C.A.6 processing time

Figure 4-12b. MOP 3b - staff utilization rate, DOCC and alternative 3

e. Alternative 3 outperformed the DOCC alternative in every MOP, but it retained a major bottleneck in the A2C2 section (figure 4-11c) with an average time in queue of 27.25 minutes (figure 4-11b) and 198 target nominations became stale in the A2C2 section (figure 4-11c). Additional alternatives were developed to examine steps to further decrease the number of stale targets and reduce the bottleneck. The staff pool for the A2C2 section (normally four personnel) was increased by 50 and 100 percent, but the task processing time for C.A.6 was held constant (alternatives 6 and 7). The size of the ASOC staff section was reduced by two personnel in both alternatives. The ASOC was chosen because of its low staff utilization rate (figure 4-8b). Results of comparisons with these alternatives is listed in figure 4-13.



Alt	Alt 3	Alt 6	Alt 7
	198	133	101

Alt 3 = 30% Cut in C.A.6 processing time
Alt 6 = Increase A2C2 personnel from 4 to 6
Alt 7 = Increase A2C2 personnel from 4 to 8

Figure 4-13. MOP 2c - number of stale target nominations, alternatives 3, 6, & 7

f. Both alternatives 6 and 7 reduced the number of stale targets. The greatest improvement occurred in alternative 6 (198-133=65, or a 33 percent decrease in the number of stale targets compared to alternative 3). Alternative 7 (a 100 percent increase in the A2C2 staff section over doctrine) only reduced the number of stale targets by an additional 16 percent (198-101=97, or a 49 percent decrease). Therefore, alternative 6 was selected for comparison and analysis with alternative 3 for each MOP (figure 4-14).

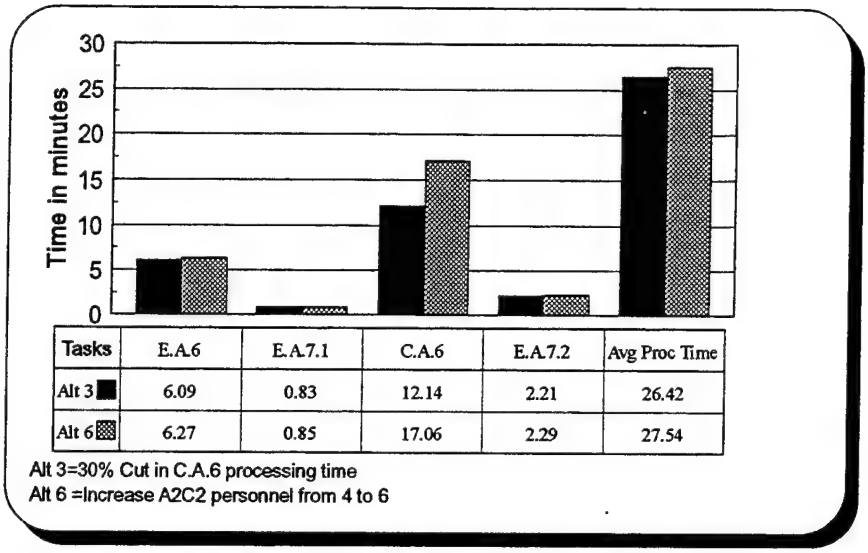


Figure 4-14. MOP 1 - average processing times, alternatives 3 & 6

g. Although alternative 6 had a smaller number of stale targets than alternative 3 (figure 4-13), the average processing time (the DOCC alternative time) for task C.A.6 was greater, as was the overall processing time for the execution cycle. Increasing the size of the A2C2 staff section by reallocating personnel reduced the number of targets that became stale, but did not improve the overall average processing time (figure 4-14). Therefore, an eighth alternative was considered, which both reduced the processing time for task C.A.6 by 30 percent and increased the size of the A2C2 section by two personnel. The results of comparisons of alternatives 3 (task C.A.6 time reduced by 30 percent), 6 (increase the A2C2 section from 4 to 6 personnel), and 8 (using each MOP) are depicted in figures 4-15, 4-16, and 4-17 below.

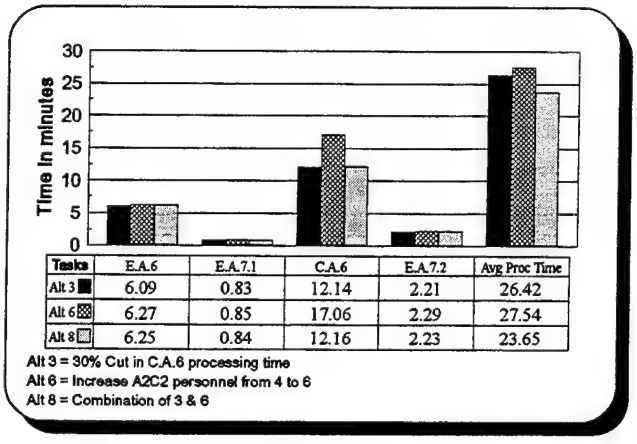


Figure 4-15. MOP 1 - processing times, alternatives 3, 6, & 8

h. MOP 1 - overall processing time (figure 4-15). Alternative 8 decreased the overall average processing time by 9.4 percent when compared to alternative 3, whereas alternative 6 increased the overall average processing time by 4 percent.

i. MOP 2 - bottlenecks. Alternatives 6 and 8 were comparable in reducing the number of target nominations in queue (figure 4-16a; 68 and 67 percent reductions, respectively) and the time that a nomination waits to be processed (task C.A.6 in figure 4-16b). However, alternative 8 was significantly better in reducing the number of nominations that became stale (figure 4-16c; 50 percent reduction versus 32 percent for alternative 6).

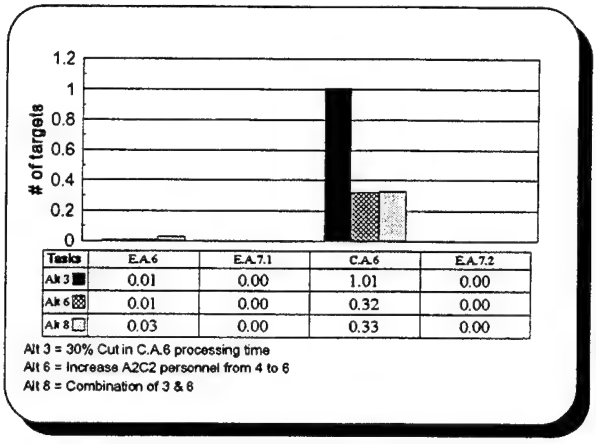


Figure 4-16a. MOP 2a - average number of target nominations in queue, alternatives 3, 6, & 8

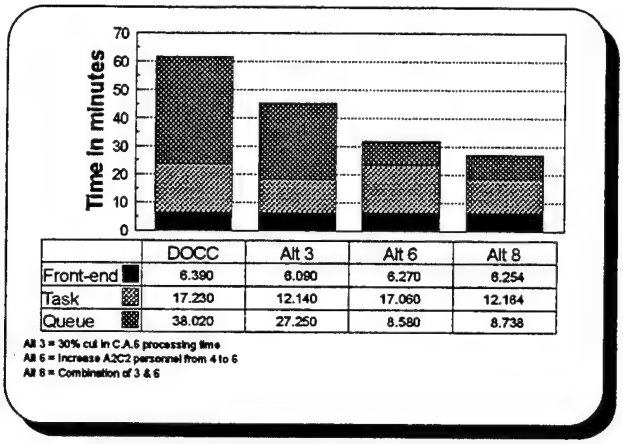


Figure 4-16b. MOP 2b - total processing time, alternatives 3, 6, & 8

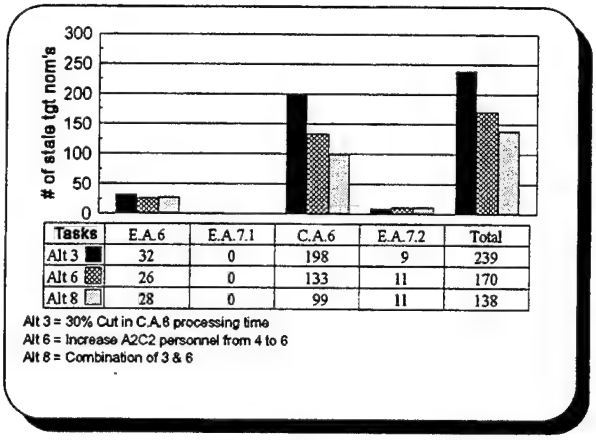


Figure 4-16c. MOP 2c - number of stale target nominations, alternatives 3, 6, & 8

j. MOP 3 - efficiencies. Both alternatives increased the percentage of target nominations processed (figure 4-17a; 4.8 percent increase for alternative 6 and a 9.7 percent increase for alternative 8) and reduced the utilization rate for the A2C2 staff section (figure 4-17b; from 49

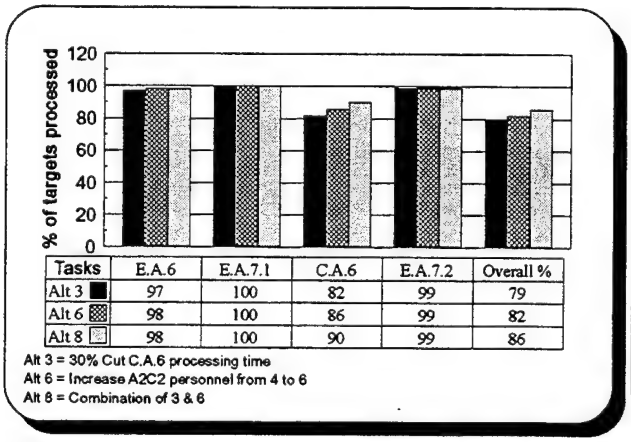


Figure 4-17a. MOP 3a - percent of targets processed, alternatives 3, 6, & 8

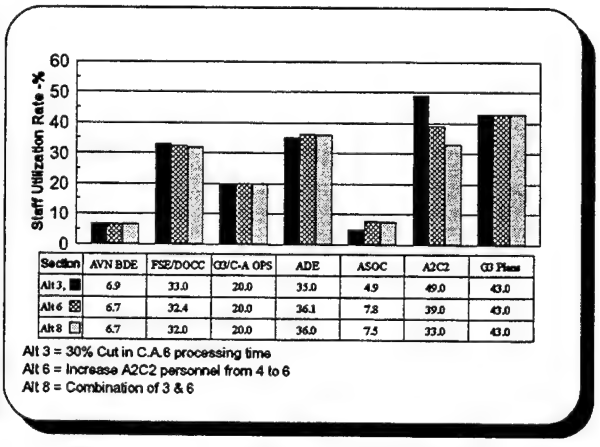
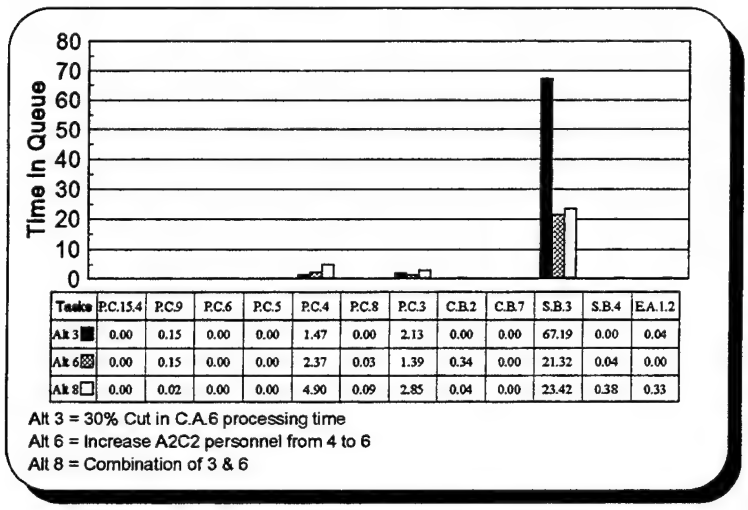


Figure 4-17b. MOP 3b - staff utilization rate, alternatives 3, 6, & 8

percent for alternative 3 to 39 percent and 33 percent for alternatives 6 and 8, respectively). Both alternatives 6 and 8 processed more nominations with less of the staff section working on average.

(1) This sensitivity analysis indicates that alternative 8 is the optimum choice, but a final sensitivity analysis was conducted to determine the effect of each alternative (3, 6, and 8) on the time in queue for messages in the planning cycle. Results of this comparison are shown in figure 4-18.



Tasks	P.C.15.4	P.C.9	P.C.6	P.C.5	P.C.4	P.C.8	P.C.3	C.B.2	C.B.7	S.B.3	S.B.4	E.A.1.2
Alt 3	0.00	0.15	0.00	0.00	1.47	0.00	2.13	0.00	0.00	67.19	0.00	0.04
Alt 6	0.00	0.15	0.00	0.00	2.37	0.03	1.39	0.34	0.00	21.32	0.04	0.00
Alt 8	0.00	0.02	0.00	0.00	4.90	0.09	2.85	0.04	0.00	23.42	0.38	0.33

Alt 3 = 30% Cut in C.A.6 processing time
Alt 6 = Increase A2C2 personnel from 4 to 6
Alt 8 = Combination of 3 & 6

Figure 4-18. Average time in queue, planning cycle, alternatives 3, 6, & 8

(2) All three alternatives reduced the average time in queue for task P.C.4 (originally 19.37 minutes; figure 4-6). Although alternative 3 had a slight increase in the queue time for task S.B.3, (67.19-53.31 = 13.8 minutes), it is not significantly longer on average. Alternatives 6 and 8 drastically reduced the time in queue for S.B.3 (from 67 minutes to the lower 20s). These alternatives, which increase the size of the A2C2 staff section, effectively simulate the ability of the A2C2 section to process multiple messages at the same time. Although decreasing the processing time reduces the size of the queue, the greatest improvement results from enhancing the section's ability to process multiple messages and target nominations.

k. Summary of the sensitivity analysis. Alternative 6 resulted in the greatest reduction to the number of target nominations held in queue (figure 4-16a; 68 percent decrease) but it was not significantly better than alternative 8 (67 percent decrease). The comparisons indicate that decreasing individual task processing time has the greatest effect on reducing queue times and total processing times, but does not, in and of itself, significantly reduce the length of time that a message or target nomination waits in queue, or the number that wait in queue on average (figures 4-11a and b). To reduce the size of bottlenecks in the system, the optimum DOCC must also improve the ability to process multiple targets and messages simultaneously. Alternative 8 (reducing A2C2 task processing time by 30 percent "through automation" and increasing the A2C2 section from 4 to 6 personnel) outperformed the base DOCC alternative and the other alternatives considered in this analysis.

4-8. Conclusions. The DOCC alternative performed significantly better than the doctrinal alternative in all MOPs. The conclusions below are the result of the sensitivity analysis conducted in the performance analysis.

a. *EEA 5. What is the optimum composition and manning level for a DOCC to make deep operations C2 procedures more efficient in terms of timeliness and effectiveness?* The structure and manning level of alternative 8 (reducing A2C2 task processing time by 30 percent "through

automation" and increasing personnel in the A2C2 section to eight) is the optimum composition for a DOCC. Alternative 8 processed targets 26 percent faster than the DOCC alternative. Additionally, alternative 8 processed 22 percent more targets than the DOCC alternative. The effect this would have on the resulting combat effectiveness of corps deep attack operations requires additional analysis.

b. EEA 6. How can planning and executing timelines be reduced using a DOCC? How can the procedures be grouped and automated to reduce bottlenecks, stale messages, and timeliness? Reduction in planning and executing timelines will result from continued integration of automation into the mechanics of developing a deep attack CONPLAN and processing target nominations within the DOCC. Automation has reduced the processing time of tasks within the DOCC, but contributes to bottlenecks in succeeding staff sections because the degree of automation is not uniform throughout the DOCC. Automation is currently used to transmit target nominations and messages within the DOCC. It must now be applied to the mechanics of planning, coordinating, synchronizing, and executing tasks to reduce the number of target nominations that become stale (bottleneck) and the queue times in the staff sections. The ultimate goal should be to achieve equivalent processing times for the tasks performed by each staff section in the FSC. Increasing the size of the affected staff sections to process targets simultaneously may reduce the size of queues and bottlenecks, but does not reduce total processing times.

c. *EEA 7. Which enhancements yield the most efficient DOCC and employ deep attack weapons/systems most effectively?* The most efficient enhancement for the DOCC is to continue to improve ADOCS capability to deconflict airspace with deep attack target nominations. The goal should be to reduce the time it takes to accomplish this task by 30 percent. This enhancement to current capability will greatly increase the number of stargets available to deep attack systems, which could improve the combat effectiveness of corps deep attack operations.

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DEEP OPERATIONS COORDINATION CELL (DOCC) ANALYSIS
CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5-1. Conclusions.

a. Emerging doctrine recognizes that prosperous deep attack operations are crucial to generating decisive combat power throughout the depth of the battlefield. Coordinated and synchronized combat operations, consisting of both close and deep attacks, are intended to present the enemy with more actions then he can react to effectively and, thereby, overload his ability to cope with any of them. This understanding dictates that the deep battle is more than shaping and metering the enemy for the future close battle. Rather, it is a complementary, but distinct, fight in its own right. Corps deep operations are conducted to engage enemy forces to the fullest extent of our weapons and doctrine capabilities while simultaneously isolating the current, close battle and creating conditions necessary for overwhelming success. Key to successful execution is the development of automation systems to improve horizontal processing and presentation of information within the corps command post. Effective use of these processes and systems to conduct deep operations enhances our ability to:

(1) Strip the enemy's ability to concentrate combat power and attack in depth.

(2) Create the opportunity to attack and defeat enemy forces on several echelons at one time.

(3) Influence where and when future fights occur.

(4) Provide us with the ability to fight outnumbered and win.

b. Corps in the field have established deep operations cells and are contributing to the development of automation that enhances deep operations C2 procedures.

c. *Decide-detect-deliver* targeting methodology. The four deep operations functions of plan, coordinate, synchronize, and execute support the targeting methodology. The "plan" function corresponds to *decide,* and the "execute" function corresponds to *detect-deliver.* Experience in the development of deep operations procedures has added the terms *track/decide* to the *detect* step and *assess* to the *deliver* step. *Tracking* is necessary because modern sensor systems have the capability to look beyond the corps' area of interest both in time and space. Our technology gives us the ability to acquire targets before it is necessary or desirable to attack them. Tracking implies the ability to continually monitor "selected" targets after they have been detected so that a more informed decision can be made as to "when" and "where" to attack them as the situation dictates. *Assessing* is necessary to evaluate the effects of our deep attacks and better plan, integrate, coordinate, and synchronize follow-on deep attacks.

d. EEA 1. *What C2 procedures (functions, processes, tasks, and subtasks) are required to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?* A common set of deep operations C2 procedures were identified from doctrinal publications and corps field SOPs (functional analysis, chapter 3). The C2 procedures were grouped under the functions of plan, coordinate, synchronize, and execute (appendixes B, C, D, and E, respectively). Observations over the course of this study have led to the conclusion that there are two dominant functions (plan and execute) that must be supported by coordination and synchronization (appendix O).

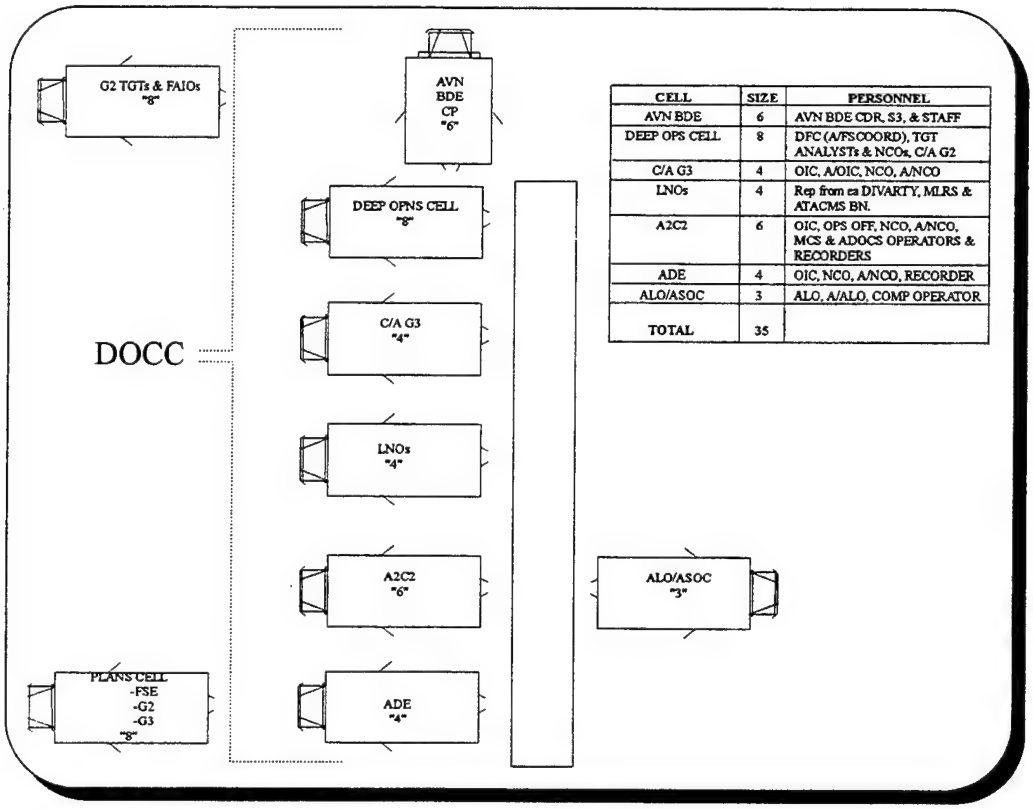
e. EEA 2. *Which staff sections perform deep operations C2 procedures (doctrine, V/III/ XVIII Corps)?* Current doctrine calls for key players in the corps command post to form a "targeting cell" to develop deep attack operations priorities and guidance. Units in the field and practical experience have found the ad hoc targeting cell technique to be **deficient**, "wasteful and ineffective because there is no central agent or staff element responsible for coordinating and synchronizing the guidance issued by the targeting cell." A **solution** proposed by draft doctrinal literature and currently being developed is to establish a cell with continual responsibility and authority to perform deep operations C2 procedures. The DOCCs serve as central agents within the headquarters responsible for planning and executing operations at depth to support each corps.

f. EEA 3. *What are the inputs and outputs of each C2 procedure, and what is the source of each input and who is/are the recipient(s) of each output?* Inputs/outputs were identified from doctrinal publications and corps field SOPs. The inputs/outputs are included in doctrinal "flow" diagrams contained in appendix I. The lists of tasks/subtasks for EEA 1 and inputs/outputs were validated by direct observation during the July 1994 V Corps CARAVAN GUARD CPX.

g. EEA 4. *What is the best structural network (the flows and "triggers" of tasks in series or parallel through the various staff sections/cells) to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets?* Corps level structures were identified for the doctrinal (appendix F), III Corps (appendix G), and V Corps (appendix H) staffs which are responsible for deep operations planning and execution. There is no dedicated group of individuals to specifically develop a deep annex to the OPLAN in the current doctrinal structure. However, draft doctrinal publications indicate a DOCC is being included in future versions of FM 100-15, *Corps Operations.* Both III and V Corps have established DOCCs within their FSCs. These initial efforts (modifications to staff organization, reapportionment of tactical responsibility, and the introduction of automation - ADOCS being the primary example) provide the basis to continually streamline the coordination and synchronization of deep operations planning and execution. These modifications to doctrine (DOCC and ADOCS) have significantly improved the horizontal processing of information (combat intelligence, target nominations, and command guidance) within corps FSCs.

h. EEA 5. *What is the optimum composition and manning level for a DOCC to make deep operations C2 procedures more efficient in terms of timeliness and effectiveness?* A DOCC should be composed of personnel currently assigned to the Corps FSE, augmented with corps or corps artillery G2 personnel, the corps combat aviation brigade, the corps ALO, and the corps

A2C2 cell. This permanent base structure should be augmented with the Air-Naval gunfire liaison company (ANGLICO) staff as needed. The most feasible means to deploy this structure is to integrate the DOCC with the corps artillery G3. The logic in structuring the DOCC around the corps artillery staff is that the corps artillery commander (FSCOORD) already has command of the majority of the corps deep fire support assets, an habitual planning and coordinating relationship with the ASOC, and a staff to develop deep attack contingency plans. The aviation brigade is a separate asset that requires support of the corps artillery to enhance survivability. Although the A2C2 is a substaff of the corps G3, it has the direct responsibility to coordinate the corps airspace and deconflict rotary and fixed-wing aerial routes with corps air defense coverage and deep attack weapon systems. Integration of these assets, systems, and capabilities with the corps artillery staff is the best way to ensure a single chain of responsibility and unity of effort. Recommended manning level for these staff sections is listed in figure 5-1 below.



CELL	SIZE	PERSONNEL
AVN BDE	6	AVN BDE CDR, S3, & STAFF
DEEP OPS CELL	8	DFC (A/FSCOORD), TGT ANALYSTs & NCOs, C/A G2
C/A G3	4	OIC, A/OIC, NCO, A/NCO
LNOs	4	Rep from ea DIVARTY, MLRS & ATACMS BN.
A2C2	6	OIC, OPS OFF, NCO, A/NCO, MCS & ADOCS OPERATORS & RECORDERS
ADE	4	OIC, NCO, A/NCO, RECORDER
ALO/ASOC	3	ALO, A/ALO, COMP OPERATOR
TOTAL	35	

Figure 5-1. DOCC manning level

i. EEA 6. *How can planning and executing timelines be reduced using a DOCC? How can the procedures be grouped and automated to reduce bottlenecks, stale messages, and timeliness?* The best way to further reduce planning and executing timelines is to use automation to perform portions or all of deep operations tasks rather than just passing information among FSC elements.

(1) The overall processing time for deep operations planning tasks was 1,452 minutes for the doctrinal alternative and 948 minutes for the DOCC alternative. The primary reason for the greater time in the doctrinal alternative is that it requires development of staff estimates and

selection of a course of action (COA) prior to develop of a deep operations plan, whereas in the DOCC alternative planning begins with the receipt of the commander's concept for deep operations and is augmented with staff estimates as they are completed.

(2) For the execution cycle, the DOCC alternative was faster than the doctrinal alternative for every task evaluated. The average time to complete the execution processing per target was 85.15 minutes for the doctrinal alternative and 31.81 minutes in the DOCC alternative. The improved processing times for all tasks in the DOCC alternative is directly attributable to the use of ADOCS and other automation (WARRIOR and MCS) to expedite the horizontal processing of targets within the DOCC and other staff sections in the FSC.

(3) The DOCC had fewer target nominations become stale and processed more targets overall (67 percent compared to 23 percent for the doctrinal alternative) compared to doctrine. The reason for the improved performance of the DOCC alternative was the use of ADOCS and other automation (WARRIOR and MCS) to reduce the horizontal processing time of targets and messages within the FSC and DOCC.

(4) Automation has reduced the horizontal processing time of tasks within the FSC, but it must now be applied to the mechanics of developing, planning, and wargaming contingencies. Further regrouping of deep operations procedures is not likely to improve performance of the deep operations system because the current structure is consistent with the logic and common sense approach of the *decide-detect-deliver* methodology. As an example, there is no benefit to deconflicting a proposed ATACMS target nomination with fixed-wing and aviation air routes *before or concurrent* with verifying the nomination with the latest attack guidance.

j. EEA 7. *Which enhancements yield the most efficient DOCC and employ deep attack weapons/systems most effectively?* The analytic comparisons (chapter 4) indicate that decreasing individual task processing time within the A2C2 has the greatest effect on reducing queue times and total processing times, but does not, in and of itself, significantly reduce the length of time that a message or target nomination waits in queue, or the number that wait in queue on average.

(1) To reduce the size of bottlenecks in the system, the optimum DOCC must also improve the ability to process multiple targets and messages simultaneously. Alternative 8 (reducing A2C2 task processing time by 30 percent "through automation" and increasing the A2C2 section from 4 to 6 personnel) outperformed the base DOCC alternative and the other alternatives considered in this analysis. The most efficient enhancement for the DOCC is to refine and document the procedures necessary to deconflict corps airspace with U.S. and allied fire support systems (Army, Air Force, Naval gunfire and aviation) and apply automation capabilities to improve performance. Currently, ADOCS speeds the passing of information between the staff sections in the CP, but processing the information within the staff section often depends on "man-in-the-loop" procedures before it is passed to the next staff section via the automated system. A2C2 procedures are more affected by this limitation than other staff sections that make up a DOCC because its functions encompass all of the deep attack weapon systems in the corps.

(2) Army, Air Force, Navy, and allied C2 procedures come together in the A2C2 section before a target nomination can be approved. As a result, the A2C2 section is a natural bottleneck for the processing of information and target nominations and, therefore, the most likely place to apply technology. Reducing the time required to clear target nominations will greatly improve the effectiveness of corps deep attack operations.

5-2. Recommendations.

a. Institutionalize *track* and *assess* in the targeting methodology. The article "Deep operations: a look from the BCTP at the process" in the March 1994 *Combat Training Centers Bulletin No. 94-1* provides an excellent discussion on the importance and mechanics of the decide-detect-*track*-deliver-*assess* methodology. The article concludes "that the successfully executed deep fight, planned using the *decide-detect-track-deliver-assess* methodology, considering all division assets which are organized for combat with the deep fight in mind: with execution controlled in the main CP, or at a location with the key players and communications links in place; followed up by aggressive target damage assessment which serves as the input for another iteration of the targeting process, is the first step in synchronizing the battlefield and sets the conditions for success in the overall battle."

b. Modify corps TO&Es, doctrine, and FMs to include a dedicated DOCC to leverage sensor and weapon capabilities. Place the responsibility and authority to plan and execute deep operations attacks with corps artillery commanders.

c. Continue development and refinement of ADOCS. Use its interactive graphical capabilities as the start point for continued development of future fire support C2 systems.

d. Perform additional analysis and experiments to determine the values of:

(1) Refining A2C2 procedures to clear ATACMS missions. Explore methods to integrate automated systems in the ASOC with the ADOCS to ultimately create one element to truly coordinate and control the corps airspace.

(2) Developing automated graphical decision aid tools to support the wargaming process. Ultimately, the capability should allow several different COAs and CONPLANs, with different task organizations, to be entered and fought. Additionally, the display should access existing target data bases and allow the input of routes and axes of advance. Finally, the tool should have a rough force-on-force simulation model to quantify the expected results of the various COAs.

(3) Developing methods to integrate ADOCS display and graphics capabilities with the Advanced Technologies "corps command post" system. A need exists to integrate the deep attack CONPLAN graphics and routes with the digitized terrain of the corps command post system and allow the commander to interact with the display and modify routes, axis of advance, and engagement areas in accordance with his intent.

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APPENDIX A

DEEP OPERATIONS COORDINATION CELL ANALYSIS

STUDY PLAN

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Study Plan TRAC-SP-0593
1 February 1994

STUDY PLAN

FOR THE

DEEP OPERATIONS COORDINATION CELL ANALYSIS

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CONTENTS

STUDY PLAN
for the
DEEP OPERATIONS COORDINATION CELL ANALYSIS

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1. Purpose. The purpose of this plan is to identify the study issues to be addressed by the Deep Operations Coordination Cell (DOCC) analysis and outline agency responsibilities for the conduct of the analysis. DOCC is an initiative to automate and streamline current corps level planning, coordinating, synchronizing, and executing of deep attack operations.

2. References (see appendix A).

3. Terms of reference.

a. Problem.

(1) The military must streamline the command, control, communications, computer, and intelligence (C4I) process to maximize combat power. **For critical deep attack operations** (especially against opponent theater missiles), **the planning, coordinating, and synchronizing times and executing ("sensor-to-shooter") timelines are too long.**

(a) Deep attack operations revealed command and control (C2) problems during Desert Storm. Principal reasons were the speed, mobility, and lethality of modern joint weapon systems that outran operations orders (OPORDs) which required three days to prepare and the long (sensor-to-shooter) times required to identify, locate, and confirm targets (especially theater missiles -- Scuds), obtain "commander" approval to engage identified targets, identify and notify attackers (i.e., shooters), and compute technical data to fire on the target. "Sensor" includes <u>all</u> national command and <u>all</u> military intelligence systems available.

(b) Enemy theater missiles (TMs) were high-visibility targets that successfully eluded U.S. military efforts. Today there are numerous, politically questionable countries that have the resources to buy or build theater missiles. It is imperative that U.S. military develop the capability to "decide, detect, *(decide)*, deliver" regarding enemy theater missiles.

(c) The capability to plan, coordinate, and synchronize attacks on enemy C2 facilities, follow-on maneuver forces, logistics bases and trains, and air defense systems deep must be improved. The results of deep attacks must be relayed to the planners of close operations to leverage the close battle.

(2) The Director of the Depth and Simultaneous Attack Battle Lab (D&SA BL), Ft. Sill, OK, has requested the Training and Doctrine Command's (TRADOC) Analysis Center (TRAC) - Study and Analysis Center (SAC) develop operational requirements for DOCC and model and analyze currently fielded capabilities to identify improvements to deep operations C2 procedures. The need exists for analysis to support decisions regarding configuration (functions and manpower/user assessment) and accuracy, timeliness, and efficiency of deep operations C2

procedures. This study is to be supported through functional analyses and simulations. This effort will examine corps elements that are currently involved in planning, coordinating, synchronizing, and executing deep operations, to include identifying requirements for detection of high payoff targets.

b. Impact of the problem.

(1) Current deep attack operations employment doctrine is evolving and does not totally support integration of deep attack with close battle space operations. The separation of these two battle space areas negates the capabilities that technology provides in reducing time and space in the commander's engagement of critical enemy assets that can dramatically influence the conduct of operations throughout the depth of the battlefield.

(2) Current man-in-the-loop coordination procedures at corps level have minimized the benefits of vertical coordination nodes laid out in the "decide-detect-*decide*-deliver" (D4) methodology of current doctrine. The inability to rapidly process the improved target detection, identification, classification, and other near real-time information available from current assets means that deep attack assets fail to meet the increased demands of changing strategic missions. Improvement of the planning, coordinating, synchronizing, and executing processes are critical for deep attack operations to serve effectively as a precision strike option in the deep battle space.

(3) Long-term solution. The U.S. Army is developing the Army Battle Command System (ABCS), an automated C4I system that will be used to provide commanders a common picture of the battlefield; project situations, requirements, and capabilities; determine the impact of possible courses of action; develop staff estimates; and present findings and recommendations. ABCS will assess information from diverse sources, incorporate this information into the decisionmaking process, and interface with other C2 systems to assist the development of optimal courses of action. ABCS will use common hardware and software to the maximum extent possible. ABCS will not be available as a total system until the 21st century.

(4) Proposed interim solution. The Director of the D&SA BL has proposed development of a deep operations coordination cell (DOCC) to provide the above capabilities in 1994. The DOCC will use existing hardware and software that have been developed independently to consolidate and automate as many functions as possible until ABCS is available. Separate computers will be linked together and software integration programs will be developed to share data. An initial DOCC is planned for testing by the XVIII Airborne Corps in May 1994.

c. Scope. This analysis will examine DOCC within the corps main command post (CP). The focus of this study will be to conduct analyses by recommending the staff configuration and the sequence of deep operations C2 procedures (functions, processes, tasks, and subtasks (F/P/T/ST), extracted from doctrinal publications and standing operating procedures of corps in the field) to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets. The C2 procedures will be translated into functional flow diagrams from which computer models will be developed. The models will be used to test and analyze alternative configurations and identify opportunities for automating to

enhance the ability of the corps to conduct deep operations. The study will focus primarily on the area of deep operations planning, coordinating, and synchronizing (decide-detect). The executing (*decide*-deliver) will be addressed via Operation Crossbolt (discussed below). Theater missile defense (TMD) will be the vehicle to focus enhancements, as this is considered to be the most time sensitive and critical target for deep operations (see *Assumption,* below).

(1) DOCC is being developed between D&SA BL and the Missile Command (MICOM) (currently building a testbed DOCC). DOCC will be exercised during an Air Force conducted operational concept demonstration (Operation Crossbolt (OC)) to test developing TMD capabilities. The goal of OC is to develop/streamline procedures to reduce the total TMD sensor-to-shooter timeline.

(2) OC will be four-phased, with phases II and IV being live-fire exercises. D&SA BL is "piggybacking" on OC to develop DOCC execution procedures and to organize equipment. Therefore this analysis will focus also on the TMD portion of deep operations.

d. Assumption. If regrouping and selectively automating procedures reduces bottlenecks, number of "stale" messages, length of critical path, and sensor-to-shooter timelines for TMD, the procedures can be enhanced and timelines can be reduced for deep attack operations on enemy C2, follow-on maneuver forces, operational reserves, logistics (sustainment), and suppression of enemy air defense; situational awareness; and battlefield damage assessment.

e. Limitations.

(1) This study will not measure the ability of a DOCC to link the deep and close battles.

(2) This study is limited to Enhanced Concept Based Requirements System domains of doctrine (C2 procedures), organization (staff sections and manpower), and materiel (automation and communications) for the proposed DOCC. Training, leader development, and soldiers domains will not be addressed.

(3) Simulations will be limited to the use of Modeler, C2NET (a performance model), or modification/enhancement there to. Combat models will not be used in an attempt to assess the contribution of DOCC to force effectiveness.

f. Objectives.

(1) Identify deep operations deficiencies, requirements, and C2 procedures with functional flows.

(2) Propose and evaluate DOCC staff configurations and groupings of procedures to overcome DOCC shortfalls identified in the analysis. Reduce staff processing time required to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets. Identify manual procedures to automate.

(3) Evaluate/recommend improvements to enhance the accuracy and effectiveness of DOCC. Assess DOCC requirements for the sequence of performing C2 procedures.

g. Essential elements of analysis (EEA). [TRAC-SAC]

(1) EEA 1. What C2 procedures (functions, processes, tasks, and subtasks) are required to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets? [Objective (1)]

(2) EEA 2. Which staff sections perform deep operations C2 procedures (doctrine, V/III/ XVIII Corps). [Objective (1)]

(3) EEA 3. What are the inputs and outputs of each C2 procedure, and what is the source of each input and who is/are the recipient(s) of each output? [Objective (1)]

(4) EEA 4. What is the best structural network (the flows and "triggers" of tasks in series or parallel through the various staff sections/cells) to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets? [Objective (1)]

(5) EEA 5. Which staff sections and procedures (functions, processes, tasks, and subtasks) should be consolidated into a corps DOCC to make deep operations C2 procedures more efficient in terms of accuracy, timeliness, and effectiveness? [Objective (2)]

(6) EEA 6. How can planning, coordinating, synchronizing, and executing timelines be reduced using DOCC? How can the procedures be grouped and automated to reduce bottlenecks, stale messages, critical paths, and timeline(s)? [Objective (2)]

(a) What are the processing bottlenecks, i.e., where are queues built up that result in stale messages (messages that become old before they can be processed)?

(b) What is the processing critical path?

(c) What deep operations C2 procedures should be automated?

(7) EEA 7. Which enhancements yield the most efficient DOCC and employs deep attack weapons/systems most effectively? [Objective (3)]

h. Methodology (see figure next page).

(1) Literature search. C2 procedures (functions, processes, tasks, and subtasks - (F/P/T/ST). TRAC-SAC will:

(a) Identify deficiencies in performing deep operations C2 procedures.

(b) Identify requirements for improving deep operations C2 procedures.

(c) Identify deep operations F/P/T/STs by performing a literature search of doctrinal publications. Develop F/P/T/STs iteratively with USAFAS reviews.

(d) Identify staff sections that perform deep operations F/P/T/STs (C2 procedures). Develop staff sections iteratively with USAFAS reviews.

(e) Identify the input(s) and output(s) (I/Os) for each F/P/T/ST. Identify the source of each I/O. Develop I/Os iteratively with USAFAS reviews.

(f) Develop flow diagrams ***(doctrinal, III/V/XVIII Corps)*** that link the F/P/T/STs, to include the I/Os. Develop flow diagrams iteratively with USAFAS reviews.

(2) No-DOCC base case. TRAC-SAC will:

(a) Review doctrinal publications and reports from Dessert Storm to identify deep operations doctrinal deficiencies and requirements for improving deep operations C2 procedures.

(b) Review C2NET to determine how well the modeled C2 processes represent procedures found in doctrinal publications. Assess C2NET to determine if it can be used for this analysis or whether it would be more efficient to develop a new model using Modeler.

(3) Hybrid DOCC. TRAC-SAC will:

(a) Develop a "hybrid DOCC" based on the required C2 procedures and doctrinal deficiencies identified above. The hybrid DOCC will be centered around DOCCs found in standing operating procedures (SOPs) from corps in the field. These corps have developed ad hoc DOCCs because of doctrinal deficiencies in performing deep operations.

(b) Analyze the "hybrid DOCC" to ensure that adequate personnel are available from doctrinal staff sections to fill the DOCC without adding spaces, and that there are enough personnel to perform all the DOCC C2 procedures.

(4) Computer model. TRAC-SAC will modify C2NET or build a new model to represent deep operations C2 procedures and the "hybrid DOCC" (dependent of the C2NET assessment results, above).

(5) Hybrid DOCC. TRAC-SAC will:

(a) Use computer model to identify potential bottlenecks, critical paths, and opportunities for automating, and develop enhanced DOCC staff configurations and groupings of procedures. The computer model will be used to find the least bottle necks, stale messages, critical path, and planning, coordinating, synchronizing, and executing timelines.

(b) Propose changes in procedures to improve accuracy, timeliness, and effectiveness.

(6) Final Report. The study concludes with a final report (results from Hybrid DOCC analysis)/in-process review (IPR). The report and analysis results should then be used by D&SA BL as input for selection of a final version DOCC .

i. Measures of performance (MOP).

(1) Times to plan, coordinate, and synchronize (decide-detect) and execute (*decide*-deliver) deep operations.

(2) "Bottlenecks."

(a) Average number of messages in queue.

(b) Length of time messages in queue.

(c) Number and location of "bottlenecks."

(d) Time-length of critical and short paths.

(3) Efficiencies.

(a) Number of messages processed.

(b) Number of stale messages.

(c) Percent of staff utilization.

j. Related studies, demonstrations, and exercises (see appendix B).

4. Support and resource requirements.

a. Support requirements.

(1) Study Directorate (SD), TRAC-SAC, will:

(a) Prepare and obtain certification and approval of the study plan. [Delivery: 15 February 1995]

(b) Develop for D&SA BL, USAFAS: [December 1993-February 1994]

1. Deep operations procedures (functions, processes, tasks, and subtasks).

2. Staff sections required to perform deep operations procedures.

3. Inputs/outputs for deep operations procedures, to include sources and customers.

4. Deep operation procedure flow diagrams.

(c) Estimate staff processing times for C2NET/Modeler.

(d) Assist in developing DOCC enhancements and data.

(e) Answer all EEAs. Conduct C2NET/Modeler runs and initial analysis. Identify critical functions and recommend alternative structures.

(f) Brief study review group (paragraph 5b) on results. [Delivery: August 1994]

(g) Write final report. The final report will present additional DOCC alternatives explored, indicating groupings of procedures and opportunities for automating, and timelines for each alternative. [Delivery: August 1994]

(2) D&SA BL, will provide to TRAC-SAC:

(a) Review answers to EEAs 1-5 [as developed by TRAC-SAC] and develop desired alternatives to be modeled and analyzed. [Delivery: 28 February 1994]

(b) Provide to TRAC-SAC temporary duty (TDY) funding (table 1) to attend meetings and IPRs as needed to conduct this study (figures at table 1, below, are based on a computation which includes number of people/per day, air fare, rental car, and per diem).

Table 1. Estimated DOCC study TDY costs

EVENT		# Days	# TRAC Pers	Est Cost
Study coordination at:				
USAFAS	Brief study plan to D&SA BL	2	3	1,200
USAPHS	Coordination	2	2	1,000
USAFAS	Brief interim results	2	2	800
USAPHS	Coordination	2	2	1,000
USAFAS	Brief final results	2	3	1,200
MICOM	Meetings (2 each)	3	2	2,800
MICOM	Demos/exercises (2each)	4	2	3,600
TOTAL EST COST:				$11,600

(3) D&SA BL/DCD, USAFAS will provide to TRAC-SAC:

(a) Data as required in paragraph 4c, below.

(b) C2 and field artillery functional expertise, as required.

(4) MICOM will provide TRAC-SAC the technical feasibility of proposed DOCC enhancements.

b. Manpower requirements.

Table 2. DOCC study estimated manpower requirements

Organization	Yr	Period	Man Months	Support/Other
SD, TRAC-SAC	93	Aug - Sep	1	Develop study plan
	93	Oct	2	Dev SP/C2NET
	93	Nov	3	Functional Analysis
	93-94	Dec - Feb	7	Functional Analysis Flow Diagrams
	94	Feb - Apr	8	Devel/Assess Hybrid DOCC
	94	May - Jul	9	Model/analysis DOCC
	94	Aug	2	Final report
D&SA BL	93	Oct-Jan	1	Problem Definition
	94	Feb - Apr	1	Confirm EEAs 1-5
	94	May - Aug	2	Coordination

c. Data requirements. [TRAC-SAC for/with assistance by D&SA BL/DCD, USAFAS]

(1) C2 procedures (functions, processes, tasks, and subtasks) to plan, coordinate, synchronize, and execute deep operations, to include identification of requirements for detection of high payoff targets (EEA 1, delivery 31 Dec 93), staff sections required to perform deep operations C2 procedures (EEA 2, delivery 31 Jan 94), inputs/outputs for deep operation procedures, to include sources and customers (EEA 3, delivery 15 Feb 94), and procedure flows/ "triggers" (EEA 4, delivery 28 Feb 94). This information is needed by staff section, with the number of people available in each staff section (on a continuous operations basis), the number of people required to perform each task, and, if a task requires more than one person but if only one person is available, the impact on time to perform the task (e.g., if two people are required to perform a task and only one is available, perhaps it takes 2.3 times as long for the one person to complete the task compared to two people working on the task together):

(a) "Current" (i.e., as business is done now, as in corps in the field).

(b) DOCC.

(2) The priority of tasks within each "current" staff section and DOCC subsection.

(3) The minimum, modal, and maximum times required to perform each task.

(4) If any tasks are performed periodically, or external events that trigger actions (e.g., sensor reports, OPORDs, etc.) the frequency performed (e.g., every two hours, three times per day, etc.).

(5) The sequence of task performance (i.e., the flows and "triggers" of tasks) and whether the tasks are performed in series or parallel, both for the "current" case and the DOCC case.

(6) Time delays between performance of tasks due to geographical separation of staff sections.

5. Administration.

a. Study schedule.

Table 3. DOCC study schedule

MILESTONE	DELIVERY DATE	LEAD	SUPPORT REQUIRED
Draft study plan	15 Feb 94	TRAC-SAC	Ongoing coordination between TRAC-SAC and D&SA BL.
Functional Analysis - Deep attack procedures (EEA 1)	31 Dec 93	TRAC-SAC	D&SA BL approve; forward to MICOM to develop testbed DOCC for Operation Crossbolt
FLOW DIAGRAMS - V Corps - III Corps - XVIII Corps	31 Jan 94 15 Feb 94 28 Feb 94	TRAC-SAC TRAC-SAC TRAC-SAC	D&SA BL assist/approve identification of required staff sections (EEA 2) and inputs/ outputs (EEA 3) to perform deep operations C2 procedures. D&SA BL approve flow diagrams (EEA 4).
Hybrid DOCC - Develop (EEA 5) - Assess - **Interim report**	31 Mar 94 30 Apr 94 15 May 94	TRAC-SAC TRAC-SAC TRAC-SAC	D&SA BL approve Concuct IPR with Directors TRAC-SAC and D&SA BL
Model - Hybrid DOCC - DOCC runs (EEA 6) - DOCC analysis (EEA 7) - **Final report**	30 Jun 94 20 Jul 94 10 Aug 94 31 Aug 94	TRAC-SAC TRAC-SAC TRAC-SAC TRAC-SAC	 Concuct IPR with Directors TRAC-SAC and D&SA BL

b. Study review group. This group will be convened to review the work and progress of the study team at the time for the interim and final reports and as necessary to ensure other study contributor are kept informed regarding the stated objectives and milestones of this plan. Study review group members are:

(1) Director, D&SA BL, Ft. Sill, OK.

(2) Director, Combat Developments, U.S. Army Field Artillery School (USAFAS), Ft. Sill, OK.

(3) Director, TRAC-SAC, Ft. Leavenworth, KS.

(4) Director, Study Directorate, TRAC-SAC, Ft. Leavenworth, KS

(5) Chief, Concepts Laboratory, MICOM.

c. Study project officers. Mr. Larry Tolin, Study Directorate, TRAC-SAC (DSN: 552-7392), will serve as study director and MAJ Daryl Harris (DSN: 552-7391) and Mr. Kelley Stephens (DSN: 552-5418), Study Directorate, TRAC-SAC, will serve on the study team.

Annex 1

References

1. *AirLand Battle-Future Umbrella Concept* (Draft). 31 August 1990.

2. *Deep Operations Coordination Cell (DOCC) Concept* (Draft). 16 September 1993.

3. *Operation Desert Shield/Desert Storm Theater Missile Defense (Ballistic) Lessons Learned Handbook.*

4. *Corps Commander's Critical Information Requirements (CCIR).*

5. *Army Command and Control Master Plan (AC2MP).* U.S. Army Combined Arms - Combat Developments Activity, Fort Leavenworth, KS.

6. *Corps Deep Operations, Tactics, Techniques, and Procedures Handbook (1990).* July 1989.

7. *EAC and Corps Deep Operations Handbook (1992-2000), Tactics, Techniques, and Procedures (TTP).* 30 September 1992.

8. Field Manual (FM) 6-20. *Fire Support in the AirLand Battle.*

9. FM 6-20-10. *The Targeting Process.*

10. FM 71-100. *Division Operations.*

11. FM 100-5. *Operations.* June 1993.

12. FM 100-6. *Large Unit Operations.*

13. FM 100-7. *The Army in Theater Operations.*

14. FM 100-15. *Corps Operations.*

15. FM 100-15-1. *Corps Operations Tactics and Techniques.*

16. FM 101-5. *Staff Organization and Procedures.*

17. III Corps Deep Operations Standing Operating Procedures.

18. V Corps Deep Operations Standing Operating Procedures.

19. XVIII Corps Deep Operations Standing Operating Procedures.

20. *Fire Support Functional Decomposition (Redbook), Edition III*, May 1992

21. *Final Report, Command and Control Functional Area Model (C2FAM) Data Study*

22. *Final Report, I Corps G3/FSE Operations Automation Systems Architecture, Experiment 94-53*, 7 November 1994

Annex 2

Related studies, demonstrations and exercises

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1. **FAAOPS** (field artillery attack operations study, Dec 92).

2. **ZEN REGARD/WARBREAKER.** Surveillance, information, and targeting technologies supporting synchronized, accurate battle management of land, sea, air, and space assets against time critical targets.

3. **Joint Advanced Warfighting Demo**

4. **Warfighter (III Corps)**

5. **Dragonfire (XVIII Airborne Corps)**

6. **IBTA** (integrated battlefield target acquisition - CAC).

7. **CATO** (ADA school C2 OPFAC).

8. **JPSD** (joint precision strike demonstration) **94**. Develop and demonstrate an Army adverse weather, day/night, end-to-end, sensor-to-shooter, precision deep strike capability.

9. **TMD/CMTS** (critical mobile targets study, RAND).

10. **AOTASS** (TMD attack operations target acquisition and sensor study - ATMDPO).

11. **AOWRS** (attack operations weapons requirements study - TRAC-WSMR).

12. **Operation Crossbolt** (Air Force TMD operational concept demonstration).

12. **CARAVAN GUARD** (V Corps command post exercise, July 1994).

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APPENDIX B

PLANNING TASKS

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PLAN

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
P. PLAN DEEP OPS	A. DEVELOP SITUATIONAL AWARENESS	UPDATE STATUS OF CURRENT INTEL	1. MAINTAIN CURRENT ENEMY SITUATION -GRND PICTURE -AIR PICTURE -SEA PICTURE -EFFECTS OF WEATHER -EFFECTS OF TERRAIN [030-8-2010] P 5-141 G2, COC	1. DTM CDR'S RQMTS a. Merge significant aspects of the area of ops and curr enemy sit b. Dtm PIR/IR answered from all source info/intel, ICW CM&D c. Analyze and compare curr enemy dispositions/compositions w/ projected enemy sit d. Confirm or deny estimate of predicted COA and update enemy sit based on curr intel, weather, and terrain data 2. PROVIDE CDR INTEL EST AS RQD a. Include enemy capabilities, probable COAs in priority, vulnerabilities, and future intent b. Incorporate significant intel into formal intel estimate 3. MAINT SIT MAP a. Enemy sit/locations b. General friendly sit c. Significant events	Ch FSC/G3 COC/G2 G2 Rep G2/FAIO/AFIO
		UPDATE STATUS OF FRIENDLY & ADJ FORCES	2. MAINTAIN THE CURRENT SITUATION -GRND PICTURE -AIR PICTURE -SEA PICTURE -EFFECTS OF WEATHER -EFFECTS OF TERRAIN [878-8-3020] P 5-145 G3, COC	1. MAINT INFO W/IN TSOP TIME LIMITS a. Control command info system b. Spt C2 process by maint'g info system (journals, msg logs, frago's, etc) to accurately reflect curr sit c. Post sit maps w/ friendly and en sit's, ICW IR, TSOP, & G2 d. Post accurate info displays e. Depict cdr's assessment f. Depict concept of op based on cdr's intent 2. DISSEMINATE CURRENT SIT ASSESSMENT a. Provide info w/in corps' tac op cen b. Provide info to tac and rear CPs c. Provide info to subord, adjacent, and higher HQs	G3 COC G3 COC
		PREP OPS SITREP	3. MONITOR CLOSE AND REAR OPS [878-8-3021] Page 5-147 G3, COC	1. RECEIVE CLOSE OPS INFO FROM TAC CP, TO INCLUDE: a. Estimate for close op b. Current sit c. CSS status 2. RECEIVE REAR OPS INFO FROM REAR CP a. Estimate for rear op b. Current sit 3. UPDATE CORPS EST & CURRENT SIT	G3 COC G3 COC G3 COC

		UPDATE STATUS OF TAC SIT	4. RECEIVE UPDATED STAFF ESTIMATES [878-8-3019] Page 5-143 G3, COC	1. RECEIVE UPDATED STAFF ESTIMATE a. Establish time limits for updates to be submitted b. Review for completeness and accuracy 2. COORDINATE STAFF ESTIMATE a. Resolve issues b. Forward unresolved issues to headquarters cell c. Request additional info on staff action to finalize estimate 3. FORMULATE ESTIMATE OF SITUATION a. Integrate all info/assessments into an accurate representation of the current sit b. Maint objectivity in updating estimate 4. RECOMMEND ADJUSTMENT TO TACTICAL PLAN a. Present recommendations to cdr b. Receive cdr's guidance c. Receive cdr's intent 5. DISSEM ADJUSTMENTS TO FRIENDLY COA a. Coord among CPs b. Produce FRAGO	G3 COC G3 COC G3 COC G3 COC G3 COC
P. PLAN DEEP OPS [CON'T]	A. DEVELOP SITUATIONAL AWARENESS [CON'T]	UPDATE STATUS OF WEATHER INFO	5. PROVIDE WEATHER FORECAST AND OBSERVATIONS [036-8-SW01] Page 5-88/SWO,INTEL	1. PROVIDE WEA SPT ADVICE TO CURRENT OPS 2. PREPARE CLIMATOLOGICAL STUDIES AND ANALYSIS 3. DTM WEA SPT NEEDED 4. EVAL & DISSEM WEA DATA TO STAFF & SUBORD UNITS 5. PROVIDE WEA DATA TO ASSIST IN UPDATES TO IPB PROCESS	SWO, INTEL CELL
	B. DEVELOP DEEP OPS PLANNING GUIDANCE FOR NEXT: - 24-48 HOURS - 48-72 HOURS - 72-96 HOURS	DEVEL IPB	1. CONDUCT IPB [030-8-2003] Page 5-74 G2 (ASPS), INTEL	1. DEVEL BATTLEFIELD EVALUATION a. Coord w/ G3 to define areas of op and interest b. Consider METT-T throughout development process c. Coord w/ other staff sections, as rq'd 2. CONDUCT TERRAIN ANALYSIS a. Terrain data base b. Terrain factor matrix c. Terrain factor overlay d. Combined obstacle overlays e. ID avenues of approach f. Line-of-sight analysis g. Analyze ave of app, to include air ave's of app h. Devel ave of app overlays, includ'g air ave's of app 3. ANALYZE WEATHER FACTOR TO DTM EFFECTS ON FRIENDLY & ENEMY CAPABILITY a. Obtain climatic summary from SWO b. SWO devel wea factor analysis matrix c. Dtm climatic characteristics in battlefield area 4. CONDUCT THREAT EVALUATION a. Review enemy forces composition & curr status, org, tac doctrine, wpns, equip, and spt'g battlefield functions systems b. Evaluate high value targets (HVT) list c. Devel detailed enemy order of battle data base d. ID applicable threat/terrain template 5. CONDUCT THREAT INTEGRATION ICW CTOCSE (ACE) a. Devel sit templates to dtm how enemy may change disposition during an op b. Devel event template to project what events will most likely have to occur relative to enemy COA c. Integrate terrain and weather 6. UPDATES IPB	G2/FAIO/TGT ANALYST AFIO EN SWO G2/AFIO G2/FAIO/AFIO/TGT ANALYST G2

P. PLAN DEEP OPS [CON'T]	B. DEVELOP DEEP OPS PLANNING GUIDANCE FOR NEXT: - 24-48 HOURS - 48-72 HOURS - 72-96 HOURS [CON'T]	DEVEL IPR (CONT)	2. PRODUCE INTEL PRODUCTS [030-8-2004] Page 5-76 G2, INTEL	1. RECORD INCOMING INFO & INTEL a. Use intel journal b. Update intel files & intel workbook by fusing incoming intel w/ info in data base c. Maint enemy order of battle data d. Post sit map to show curr enemy activity, disposition, and relevant enemy data, IAW specified PIR & TSOP 2. EVALUATE INCOMING INFO a. Dtm pertinence b. Dtm reliability c. Dtm credibility d. Dtm criticality/time sensitivity 3. ANALYZE COMBAT INTEL AND INFO RECEIVED a. Integrate and interpret incoming reports w/ existing info from the sit map & intel data base to confirm the enemy sit & answer the IPB b. Use HPT list as a tool to ID combat info for immediate dissem c. Formulate conclusions based on available info of enemy sit, disposition, & probable COAs d. Compare curr friendly sit w/ est'd most probable en COA e. ID COA still available to enemy f. Eliminate COA no longer available g. Devel curr est of sit & probable future enemy COA 4. DEVEL INTEL PRODUCTS/SUMMARIES FOR DISSEM 5. PROVIDE INTEL SPT TO TGT'G a. Integrate info/intel into TVA to ID HVTs b. Recommend HPTs c. Provide tgt'g data in sufficient time that tgt can be engaged before it can influence close ops 6. PROVIDE INTEL SPT TO C3CM a. Recommend C3CM measures to C3 b. Monitor security measures to limit access to deception plan c. Provide feedback on effectiveness of deception and OPSEC ops, ICW Counter Intel d. Recommend changes to plan, as necessary 7. PREP TEMPLATE OF ENEMY INTEL SYSTEM 8. PROVIDE INTEL SPT TO REAR OPS	G2/FAIO G2/FAIO/AFIO/TGT ANALYST G2/FAIO/AFIO/TGT ANALYST G2/FAIO/AFIO/TGT ANALYST G2/FAIO/AFIO/TGT ANALYST G2/FAIO/AFIO/TGT ANALYST
		PREPARE DRAFT FORCE OPLAN	3. PLAN FUTURE OPERATIONS SEQUELS [878-8-3016] P 5-109 G3, PLANS	1. CONDUCT MSN ANALYSIS a. Dtm specified and implied tasks b. Dtm constraints and restrictions c. Dtm essential tasks, facts, and assumptions d. Prepare restated msn 2. RECEIVE CDR'S GUIDANCE a. Restate msn b. Designate specific COA to develop or avoid c. Consider C2, C3CM, and close, deep, and rear ops d. Other constraints/restrictions 3. PRODUCE STAFF ESTs a. Recv personnel est from G1 b. Recv intel est from G2 c. Recv log est from G4 d. Recv ca est from G5 e. Receive special staff est's from sig, FSE, chml, AD, EN, Avn, EW, deception/PSYOP, MP, and ALO 4. RECOMMEND COA a. Wargame COA b. Compare COA c. Include task org	G3 Plans G3/Ch FSC/ALO G3 G3/Ch FSC/ALO

P. PLAN DEEP OPS [CON'T]	C. DEVELOP DEEP OPS PLANS	UPDATE STATUS OF JOINT AIR SUPPORT OPS	1. PLAN JOINT AIR SUPPORT OPERATIONS [878-8-3015] Page 5-106 G3, PLANS	1. COORD JOINT AIR ATK a. Monitor coord among FSE, G3 air, TACP, & ALO and integration of tac air spt into FS plan b. Devel plan for preplanned CAS ICW G3 air, TACP, ALO, FSE, and avn section 2. PREPARE RQMT FOR AI/BAI a. Coord w/ TACP (ALO) to analyze corps' AI nominations and BAI requests b. ID msns, tgts, and tgt types base on available info c. Assign priority and precedence to each nomination/request d. Dissem prioritized tgt list to subord units 3. PLANS JAAT RESOURCE ALLOCATION a. Coord w/ G2 for IPB to ID potential engagement areas and updates of enemy sit b. Coord w/ FSE for FS c. Coord w/ AVN LO for avn assets d. Coord w/ TACP ALO for USAF assets e. Integrate assets into scheme of maneuver 4. PLANS FOR JSEAD a. ICW G2, ID enemy AD sys that may hinder army and AF airborne systems b. Coord W/ FSE for FS c. Coord w/ AVN LO for avn assets committed to JSEAD d. Coord w/ TACP (ALO) for USAF assets in spt of JSEAD e. Integrate assets into scheme of maneuver 5. PROVIDES INPUT FOR TACTICAL AIR RECONNAISSANCE a. Coord w/ G2, A2C2 elem, and tac ALO for prep of request to spt corps' intel rqmts b. Review priority assigned by G2 for the collection effort 6. PLAN FOR TACTICAL AIRLIFT a. Alert rear ops cell, TALO, and subord units of pending movement b. Monitor rear CP planning for movement of personnel, equip, and supplies 7. UPDATE PLANS, AS NECESSARY	ADE/G3 Air/ALO/TGT ANALYST G3 Air/ALO ADE/G3 Air/TACP/TGT ANALYST ADE ALO/ASOC G3 Air G3 COC
		ID C3CM CONSTRAINTS/ RESTRICTIONS	2. PLAN C3CM [878-8-3017] Page 5-111 G3, PLANS	1. DTM C3CM FOCUS a. Receive cdr's concept b. Assess enemy intel and counter C3 capabilities, ICW G2 c. ID corps' characteristics vulnerable to enemy intel counter C3 actions, ICW G2 d. Review theater/army C3CM plan 2. PLAN DECEPTION MEASURES a. ID desired enemy action or nonaction, tgt, and objectives b. Dtm desired enemy perception of friendly ops c. Devel credible deception story that will convey the desired perception d. Plan friendly actions to convey the deception story e. Coord potential spt and use of radio freqs w/ sig section 3. PLANS FIRES AND/OR JAMMING TO DEGRADE ENEMY C3 SYSTEMS a. ID critical enemy C3I nodes b. ID HPTs c. Devel FS and/or jamming actions 4. DEVEL EEFI 5. PLANS OPSEC MEASURES THAT DENY THE ENEMY TARGETING INFO a. Include deception to protect C3 b. Est false CPs c. Est false commo networks d. Include forward jamming 6. PLANS COUNTER C3 a. Include jamming between enemy C2 nodes b. Include fires against enemy sensors, CPs, & commo nodes	Ch FSC/EW EW EW/TGT ANALYST EW EW/G2 EW

P. PLAN DEEP OPS [CON'T]	C. DEVELOP DEEP OPS PLANS [CON'T]		2. PLAN C3CM [Continued]	7. PLANS CORPS C2 PROTECTION MEASURES a. Reduce C2 node signature b. Locate C2 facilities in hardened structures or excavated emplacements c. Disrupt enemy collection capabilities by screening and forward jamming d. Include dummy facilities e. Include destruction of enemy collection and FS assets	EW/G2
		PREPARE AD ANNEX	3. PLANS AIR DEFENSE OPERATIONS [044-8-AD02] Page 5-119 AD Sec, PLANS	1. PREP AIR DEFENSE EST a. Coord w/ FSE b. Include ROE c. Include hostile criteria d. Include wpns control status e. Include defense readiness conditions f. Include AD warnings g. Include capabilities/limitations of AD assets h. Include priorities of support i. Include AD asset allocation j. ID discrepancies and recommend solutions k. Include plan to minimize effects of EW on AD l. Coord airspace control measures w/ A2C2 elem 2. PREP AIR DEFENSE ANNEX	ADE ADE
		DEVELOP AND COORDINATE A2C2 PLAN TO SUPPORT OPS	4. DEVELOP AND COORD A2C2 PLANS TO SUPT TAC OPS [878-8-AC01] Page 5-175 A2C2 Elem, COC	1. EnsureA2C2 plan supports concept of operation 2. Ensure A2C2 plan complies with higher hq guidance 3. Ensure A2C2 plan maximizes procedural control while allowing maximum airspace freedom 4. Ensure A2C2 plan minimizes potential conflicts among airspace users	A2C2 Elem A2C2 Elem A2C2 Elem A2C2 Elem
		PLAN JOINT AIR ATTACK OPS COORD W/ ALO FOR TACAIR	5. PLAN TAC AIR SPT [001-8-AL02] Page 5-121 ALO/TACP, PLANS	1. PROVIDE INPUT DURING ESTIMATE PROCESS a. Include capabilities/limitations of USAF assets b. Include A2C2 considerations c. Include priorities/allocations for CAS d. Include priorities for AI/BAI e. Include recon & surveillance priorities, ICW G2 f. Include airlift priorities g. ID discrepancies and recommend solutions 2. COORDINATE TACAIR SUPPORT CONSIDERATIONS a. Coord CAS allocation and immediate air requests w/ FSE/G3 b. Coord airspace control w/ A2C2 elem c. Coord JAAT w/ Army avn d. Coord SEAD/JSEAD e. Help prioritize BAI nominations w/ FSE f. Coord airlift w/ G4/G3	ALO/TACP ALO/TACP
		DEVELOP AVN ESTIMATE	6. PLAN ARMY AVIATION EMPLOYMENT [001-80AV02] Page 5-123 AVN Sec, PLANS	1. PREPARE AVIATION ESTIMATE a. Include capabilities/limitations of avn assets and crews b. Include priorities of employment c. Include avn log spt rqmts and priorities d. Include avn task org e. Include signal rqmts f. ID discrepancies and recommend solutions 2. COORDINATE W/ A2C2, FSE, G2 AD sec, ALO, TALO, & sig sec 3. PREPARE AVIATION ANNEX	AVN/G3 Air AVN/G3 Air AVN/G3 Air
P. PLAN DEEP OPS [CON'T]	C. DEVELOP DEEP OPS PLANS [CON'T]		7. PLAN DECEPTION OPERATIONS [030-8-DE01 Page 5-125 Decep Elem, PLANS	1. PREPARE DECEPTION ESTIMATE, TO INCLUDE: a. Deception objective b. Desired enemy actions or non-actions c. Perception of friendly ops the enemy must have d. Credible deception story e. Friendly actions to reinforce the enemy's mind-set that the deception story is correct f. Implementation schedule g. Feedback system to monitor deception effectiveness, ICW G2 h. Capabilities/limitations of deception i. ID discrepancies and recommend solutions 2. PREPARE DECEPTION ANNEX	G3 Plans/Dec Elem G3 Plans/Dec Elem

		ID C3CM CONTRAINTS/ RESTRICTIONS	8. PLAN EW SPT [034-8-EW01] Page 5-128 EW Elem, PLANS	1. PREPARE EW ESTIMATE a. Provide enemy electronic order of battle overlay b. Include electronic combat target list c. Establish schedule of jamming d. Provide electronic support measures/electronic CM priority list e. ID EW contingency augmentation f. Include restricted frequency list g. Establish priorities of employment h. Include EW capabilities/limitations i. ID discrepancies and recommend solutions 2. PREPARE EW ANNEX	G3 Plans, EW G3 Plans/EW
		UPDATE STATUS OF FS SIT	9. PLAN THE USE OF FIRE SUPPORT ASSETS [006-8-FS03] Page 5-130 FSE Sec, PLANS	1. PREPARE FS ESTIMATE a. Include capabilities/limitations of FS assets b. Include conventional, chemical, and nuclear fires c. Include concept of operation in coordination w/ avn, ADA, EN, EW, G3 Air, ANGLICO, & TACP d. Include counterfire plan and responsibilities e. ID discrepancies and recommend solutions 2. PREPARE FS ANNEX TO OPLAN/OPORD a. Integrate air support operations b. Integrate naval gunfire support operations c. Integrate chemical fires d. Provide field artillery support e. Integrate nuclear fires f. Include approve HPT matrix and attack guidance 3. REVIEW AD ANNEX 4. REVIEW A2C2 ANNEX 5. COORDINATE COLLECTION PRIORITIES W/ G2 TO ID TARGETS FOR LETHAL AND NONLETHAL ATTACK	Ch FSC/TGT ANALYST Ch FSC/TGT ANALYST Ch FSC Ch FSC Ch FSC/TGT ANALYST
		UPDATE STATUS OF FS SIT	10. PLAN THE USE OF NUCLEAR WEAPONS [006-8-FS10] Page 5-215 FSE, FSC	1. PREPARE CORPS' NUCLEAR PACKAGE PLAN FOR SUBMISSION TO EAC a. Perform preclusion oriented target analysis b. ID nuclear aspects of priority intel rqmts and IPB & ID nuclear oriented NAI ICW G2 c. Allocate nuclear wpns to divisions for employment in sub-pkgs and to corps arty to support the Theater/Army campaign plan and cdr's intent d. Devel initial nuclear pkg for decision briefing e. Brief corps cdr and receive guidance f. Provide sub-pkg planning guidance to divs g. Receive div's sub-pkg plans h. Brief corps cdr and receive final decision i. Provide nuc pkg to Theater/Army for integration into nuc employment plan 2. UPDATE NUCLEAR PACKAGE, AS RQD a. Receive current situation from G3 b. Receive current intel from G2	Ch FSC/TGT ANALYST Ch FSC/TGT ANALYST
P. PLAN DEEP OPS [CON'T]	C. DEVELOP DEEP OPS PLANS [CON'T]	UPDATE STATUS OF ENGINEER SIT	11. PLAN ENGINEER SUPPORT [005-8-EN03] Page 5-127 EN Sec, PLANS	1. PREPARE ENGINEER ESTIMATE, INCLUDING: a. Capabilities/limitations of EN assets b. Priority of employment c. EN asset employment in support of deception d. Employment of obstacles e. Construction requirements f. ID discrepancies and recommend solutions g. Designated corps' obstacle free and restricted zones, as rqd h. Employment of bridging support 2. PREPARE ENGINEER ANNEX	EN/G3 COC EN/G3 COC

			12. PLAN PSYOPS [033-83PS01] Page 5-133 PSYOP Sec, PLANS	1. PREPARE PSYOP ESTIMATE a. Include capabilities/limitations of PSYOP b. Include PSYOP objective c. Include tgt population vulnerability assessment, ICW G2/G5 d. Include themes for propaganda development e. Include implementation schedule f. Include feedback system to monitor PSYOPS effectiveness g. ID discrepancies and recommend solutions 2. PREPARE PSYOP ANNEX, TO INCLUDE: a. Enemy PSYOP capabilities b. Friendly PSYOP capabilities	PSYOP Sec, Plans Cell PSYOP Sec, Plans Cell
			13. PLAN SPECIAL OPERATIONS	1. PREPARE SPECIAL OPERATIONS ESTIMATE a. Conduct/update area study b. Conduct IPB as pertains to SOF c. Delineate areas of operational responsibility per SOF elem d. Designate SOCCE 2. PREPARE SPECIAL OPERATIONS ANNEX (TO OPLAN/OPORD) a. Receive CINC mission guidance b. Identify/prioritize targets c. Develop initial mission statement and MICON d. Assign mission to SF group e. Provide conceptual MTP f. Select operational area g. Identify sensitivity and oversight requirements h. Determine support requirement i. Task appropriate agency j. Task service intel production agencies through component k. Prepare Special Operations Mission Planning Folder (SOMPF)	
			14. PLAN DEEP OPERATIONS (MANEUVER FORCES)		

P. PLAN DEEP OPS [CON'T]	C. DEVELOP DEEP OPS PLANS [CON'T]	UPDATE STATUS OF CURRENT INTEL	15. PLAN INTEL OPS [030-8-2008] Page 5-91 G2, PLANS	1. RECOMMEND PIR AND IR TO SPT CONCEPT OF OPS a. Incl only enemy capabilities, vulnerabilities and characteristics of the (AO) area of operation having a major effect on mission accomplishment b. Recommend update of PIR/IR as plan develops c. ID high value target to the targeting cell 2. ANALYZE AO OPS a. Develop data base for use in preparing intel est & annex b. Prepare overlays/ templates showing avenues of approach, obstacles, key terrain, percent of slope or trafficability, vegetation, hydrology, and others, as required 3. RECV IPB PRODUCTS FROM INTEL CELL a. Incl situational templates b. Incl. event templates 4. PREP INTEL EST, ICW ASPS & CMD a. Portray enemy most probable course of action, order of battle, vulnerabilities, weather and terrain b. Include probable enemy disposition, composition, strength, committed forces, reinforcements, air, nuclear, chemical, biological agents c. Include enemy capabilities (who, what, where, when, how) d. Include conclusions e. Disseminate intelligence est to staff and subordinate units 5. PREP INTEL ANNEX a. Provide summary of enemy info b. List PIR & IR c. List measure for handling personnel, documents and material d. Direct info/intelligence collection e. List documents or equipment required f. Address counterintelligence g. Include reports and distribution h. List miscellaneous instructions i. ID TAIs, NAIs, and decision points to confirm enemy situation and facilitate future operations 6. PREP ENEMY COMBAT EFFECTIVENESS INFO 7. RECOMMEND MI ORG FOR COMBAT	G2/G3 PLANS G2/G3 PLANS G3/TGT ANALYST G2/FAIO, AFIO G2 G2 G2

P. PLAN DEEP OPS [CON'T]	D. DEVELOP COAs & WARGAMING/ ISSUE WARNING, FRAG, AND OPLAN/OPORD FOR NEXT: - 24-48 HOURS - 48-72 HOURS - 72-96 HOURS	DEVELOP FORCE ALT COAs	1. PREPARE OPS ESTIMATE [878-8-3013] Page 5-94 G3 Sec, PLANS	1. DTM SIT AND CONSIDERATIONS AFFECTING POSSIBLE COAs a. Dtm characteristics of the area of op (wea, terr), ICW G2 b. Dtm enemy sit (disposition, strength, composition, NBC capability, significant activities and weaknesses), ICW G2 c. Dtm own sit, ICW subord units d. Dtm relative combat power e. Dtm enemy's most probable COA, ICW G2 2. DEVELOP FRIENDLY COA a. Dtm feasibility of COA b. Estimate extent each COA will damage the force, incl fratricide potential c. ID the what, when, where, how, and why of the opn d. Address all elems of battlefield framework e. Analyze relative combat power f. Array initial forces g. Develop scheme of maneuver h. Dtm C2 means and maneuver control measures i. Prepare COA statement and sketch 3. RECEIVE PERSONNEL EST AND CONCEPT OF OP FROM G1 a. Est/analyze each COA and provide capabilities/limitations of unit strength, maint, replacement ops, casualty reporting ops, and non-combat ops b. ID personnel related deficiencies and recommend action to negate their effect c. Devel concept to spt which address each of the areas considered in the personnel estimate 4. RECEIVE LOG EST AND CONCEPT OF OPN FROM G4 a. Est/analyze each COA and provide capabilities/limitations of transportation network, terrain, supplies and equip transportation assets, maint, and field services b. ID log deficiencies and recommend action to negate their effect c. Devel concept of spt which address each of the areas considered in the log est 5. RECEIVE ENGINEER (EN) EST AND CONCEPT OF OP a. Analyze each COA and provide capabilities/limitations of engineer assets b. Devel concept of EN spt which address each area considered in the EN estimate c. Prioritize employment of EN assets d. Consider employment of EN assets in spt of deception e. Analyze employment of obstacles f. Recommend employment and priority of EN assets 6. RECEIVE FIRE SUPPORT EST AND CONCEPT OF OPERATION a. Analyze each COA and provide capabilities/limitations of FS assets, conventional, nuclear, and chemical b. Develop, ICW avn, EN, EW, G3 Air, ANGLICO, and TACP, a FS concept of spt c. Integrate nuc fire planning into concept of spt 7. RECEIVE AVIATION EST AND CONCEPT OF OPERATION a. Analyze each COA and provide capabilities/limitations of avn assets b. Develop concept of spt which addresses area covered in est c. Recommend employment of avn assets 8. RECEIVE AD EST AND CONCEPT OF OPERATION FROM AD COORDINATOR a. Analyze each COA and provide capabilities/limitations of AD assets b. Develop concept of spt which addresses area covered in est c. Recommend employment/priority of spt of AD assets	G3 Plans G3 G3/G1 G3/G4 G3/EN G3/Ch FSC G3/AVN G3/ADE

P. PLAN DEEP OPS [CON'T]	D. DEVELOP COAs & WARGAMING/ ISSUE WARNING, FRAG, AND OPLAN/OPORD FOR NEXT: - 24-48 HOURS - 48-72 HOURS - 72-96 HOURS [CON'T]	DEVELOP FORCE ALT COAs [CON'T]	1. PREPARE OPS ESTIMATE [878-8-3013] Page 5-94 G3 Sec, PLANS [CON'T]	9. RECEIVE NBC DEFENSE AND SMOKE EST FROM CHEMICAL SECTION a. Analyze each COA and provide capabilities/limitations of chemical assets b. Develop concept of spt which addresses area covered in est c. Recommend employment/priority of spt of chemical assets d. ID collateral damage and troop safety constraints 10. RECEIVE SIGNAL EST AND CONCEPT OF OPERATION a. Analyze each COA and provide capabilities/limitations of signal assets b. Develop concept of spt which addresses area covered in est 11. WARGAME EACH COA, ICW OTHER STAFF PLANNERS a. Dtm mods to initial dispositions, force allocations, or composition of main and supporting efforts b. Dtm deception possibilities c. Dtm combat multiplier integration d. Dtm probable enemy reaction e. Dtm critical areas/events & how success is to be achieved f. Estimate attrition of friendly and enemy forces g. Dtm lcn and commitment of fr & en follow-on and res forces h. Dtm adv/disadv of each COA i. Dtm if COA conforms to and supports theater/army plan j. Dtm if close, deep, and rear ops are mutually supporting k. Devel decision support template for recommended COA, ICW other staff section elements, to ID critical events and threat activities relative to time and place which may require a tactical decision (i.e. NAIs, TAIs, and decision points) 12. RECOMMEND COA TO CDR a. Include task org and msns to subord units b. Include augmentation force requirements c. Prioritize allocation of critical resources d. Include tactical control measures e. Include CP lcns f. Include MOPP, troop safety criteria, and operational exposure guide g. Include main effort h. Provide for reserve force and include its position i. Include C3CM j. Include five elements of the battlefield framework	G3/Chml G3/SIGO G3 G3/Ch FSC/ALO/ ANGLICO

P. PLAN DEEP OPS [CON'T]	D. DEVELOP COAs & WARGAMING/ ISSUE WARNING, FRAG, AND OPLAN/OPORD FOR NEXT: - 24-48 HOURS - 48-72 HOURS - 72-96 HOURS [CON'T]	DEVEL OPS/ CDR's ESTIMATE	2. DEVELOP THE OPLAN/OPORD [878-8-3014] Page 5-100 G3 Sec, PLANS	1. PREPARE FOR DEVELOPMENT OF OPLAN/OPORD a. Issue warning order b. Use 1/3 - 2/3 planning guidance c. Address the who, what, when, where, and why, and address the battlefield framework 2. TASK ORGANIZE THE FORCE a. Analyze forces available b. Tailor the force to conduct the operation 3. INTEGRATE INTEL CAPABILITIES INTO OPLAN/OPORD a. Review intel annex b. Coord intel collection taskings of CEWI units w/ G2, as well as recon and surveillance operations c. Incorporate intel annex into OPLAN/OPORD 4. INTEGRATE CONVENTIONAL FIRES a. Review FS plan b. Recommend FS coordination/control measures c. Provide for continuous, flexible, and adequate FS d. Incorporate FS annex into OPLAN/OPORD e. Include JAAT/JSEAD f. Recommend target priorities for deep fires 5. INTEGRATE NUCLEAR FIRES a. Include cdr's guidance for nuc wpns employment and BNW b. Integrate nuc considerations into concept of op c. ID nuc tgt'g rqmts and nuc ROE d. Integrate nuc log plan e. Include nuc appendix (nuc pkg) 6. INTEGRATE CHEMICAL FIRES a. Include tgt selection, hazard predictions, and NBC defense instructions b. Supervise prep of request for chemical wpns release 7. INTEGRATE NBC DEFENSE AND SMOKE OPERATIONS a. Include NBC unit support operations b. Include smoke generator/projected smoke operations c. Include nuclear risk criteria and MOPP 8. INTEGRATE TACTICAL AIR SUPPORT a. Obtain corps' CAS allocation b. Allocate CAS sorties c. Include NLT time for submission of preplanned targets 9. INTEGRATE AD OPERATIONS a. Review AD plan b. Establish AD priorities 10. INTEGRATE USE OF CORPS' AIRSPACE a. Review A2C2 annex b. Incorporate into OPLAN/OPORD 11. INCORPORATE JAAT/JSEAD 12. INTEGRATE ENGINEER SUPPORT a. Review obstacle plan b. Review employment of scatterable mines c. Review EN annex d. Incorporate annex into OPLAN/OPORD e. Include priorities of effort and support 13. INTEGRATE SIGNAL SUPPORT a. Allocate MCS b. Establish priority of info passed on MCS c. Review signal annex d. Incorporate annex into OPLAN/OPORD 14. INTEGRATE C3CM a. Include deception b. Include jamming c. Include fires d. Include OPSEC	G3 G3 COC G3/G2 G3/Ch FSC G3/Ch FSC C3/Ch FSC/Chml C3/Ch FSC/Chml G3 Air/ALO/TACP ADE ADE/TACP/G3 Air/AVN ADE/TACP/G3 Air/AVN G3/EN G3/SIGO A3/EW/AFIO

P. PLAN DEEP OPS [CON'T]	D. DEVELOP COAs & WARGAMING/ ISSUE WARNING, FRAG, AND OPLAN/OPORD FOR NEXT: - 24-48 HOURS - 48-72 HOURS - 72-96 HOURS [CON'T]	DEVEL OPS/ CDR's ESTIMATE [CON'T]	2. DEVELOP THE OPLAN/OPORD [878-8-3014] Page 5-100 G3 Sec, PLANS [CON'T]	15. INTEGRATE PSYOP a. Review PSYOP annex b. Monitor coordination w/ higher and adjacent HQs c. Incorporate annex into OPLAN/OPORD 16. INTEGRATE EW a. Review EW plan b. Ensure HPTs are identified 17. VERIFY CLOSE, DEEP, AND REAR OPS ARE MUTUALLY SUPPORTING 18. INTEGRATE PSS a. Evaluate the priority of PSS b. Review PSS annex 19. INTEGRATE CSS a. Include priorities of maint, trans, supplies, and field services b. Include main and alternates supply routes c. Allocate supplies, services, and trans assets d. Include implementation of aerial resupply 20. INTEGRATE CMO 21. REVIEW PUBLIC AFFAIRS ANNEX a. Evaluate spt rqd for accredited civilian news media b. Evaluate need for additional PA units and rqd spt c. Ensure provisions are made for effective cmd info program 22. REVIEW OPLAN/OPORDS a. Include msn, cdr's intent, and concept of op b. Assign collateral operations as specific tasks c. Subord unit task organized and assigned msns consistent w/ METT-T d. Graphic control measures support concept of op and allow maximum flexibility, and facilitate change in direction or lcn of main effort e. Include supporting annexes 23. ISSUE OPLAN/OPORD TO SUBORD, ADJACENT, AND HIGHER HQs	G3 EW G3/COC/C FSC/ALO/AVN G3/G1 G3/G4 G3/G5 G3/PAO G3 G3

APPENDIX C

COORDINATION TASKS

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COORDINATE

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
C. COORDINATE DEEP OPERATIONS	A. COORDINATE THE DECONFLICTION OF: - TERRAIN - MOVEMENT - RELEASE	COORD AD UNIT MOVEMENT & POSITIONING W/ G3/ADE SECTION	1. MANAGE TERRAIN [878-8-3028] PAGE 5-158 G3, COC	1. COORD ALLOCATION OF GROUND SPACE W/IN THE CORPS AREA 2. DESIGNATE/RECOMMEND BOUNDARY CHANGES a. Subordinate rear areas b. Corps' rear area c. Corps' area of operations 3. USE OPERATIONAL GRAPHICS a. Control maneuver b. Control fires	G3 COC G3 COC G3 COC
		UPDATE STATUS OF M/CM SIT (FR & ENEMY) UPDATE STATUS OF ENGINEER SIT	2. COORD ENGINEER SPT [005-8-EN04] PAGE 5-186 EN SEC, COC	1. COORD EN ACTIVITIES IN SPT OF CORPS a. Coord execution by subord units b. Provide engineer sit info to tactical CP, rear op cell, & higher HQ c. Provide current status of engineer op to cdr, G3, and FSE to adjust operations, as rqd d. Recommend and coord reallocation of resources, as rqd e. Monitor engineer msn log status f. Forward rqd reports to higher HQ 2. COORD M/CM/S OPS a. Coord changes to plan w/ G3, FSE, and G5 b. Coord subord unit execution c. Monitor CS and CSS to M/CM/S ops d. Maintain status of interdiction scatterable minefields 3. COORD SUSTAINMENT ENGINEERING OPERATIONS a. Coordinate changes to plan w/ G3 and FSE b. Coordinate subordinate unit execution c. Monitor msn logistics for sustainment engineering ops 4. COORD CARTOGRAPHIC SUPPORT, INCLUDING: a. Replenishment of units operational stock b. Issue of incoming units c. Printing/distribution of specialized topographic products 5. COORD CORPS/SUBORD UNIT'S SURVEY EFFORTS	EN/G3/Ch FSC G3/EN EN EN G3/EN
		COORD AD OPS W/IN AREA & REGIONAL AD CMDS	3. COORD AD FOR CLOSE OPS [044-8-AD03] PAGE 5-180 AD Sec, COC	1. MONITOR AND DISSEMINATE AD RULES PROCEDURES, AND PLANNED AIR MOVEMENT, WHICH INCLUDE; a. ROE b. Hostile criteria c. Weapons control status d. Airspace control measures e. Defense readiness conditions f. Air defense warnings g. Recommend changes as required 2. MONITOR STATUS OF AD UNITS a. Crew status b. Equipment status 3. ADVISE STAFF ELEMENTS ON AD EMPLOYMENT AND CAPABILITIES 4. MONITOR IMPACT OF IEW ON AD OPS 5. RECOMMEND CHANGES TO TAC PLAN AS REQUIRED 6. UPDATE AD SECTIONS IN TAC CP AND REAR OPS CELL ON CURRENT AD STATUS 7. PERFORMS A2C2 ELEM FUNCTIONS a. Assist in identifying users of Army airspace b. Advise G3 air on regulation of Army airspace c. Coordinate AD matters 8. MONITOR EXECUTION AND DAMAGE ASSESSMENT OF AIR RELATED DEEP FIRES	ADE ADE ADE ADE/EW ADE ADE ADE/G3 Air/AVN/ ALO ADE

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
C. COORDINATE DEEP OPERATIONS [CON'T]	A. COORDINATE THE DECONFLICTION OF: - TERRAIN - MOVEMENT - RELEASE [CON'T]	COORD STATUS OF AD RULES/ PROCEDURES COORD CHANGES IN AD PRIORITIES W/ G3//COORD REALLOCATION OF AD ASSETS W/G3	4. COORD AIR DEFENSE OPS [044-8-AD04] PAGE 5-196 AD SEC, FSC	1. ADVISE CDR AND OTHER STAFF ON ALL ASPECTS OF AD 2. INTEGRATE AD VERTICALLY AND HORIZONTALLY THROUGHOUT CORPS AREA 3. COORDINATE STATUS OF AD RULES AND PROCEDURES INCL: a. ROE b. Hostile criteria c. Weapons control measures d. Airspace control measures e. Defense readiness conditions f. AD warnings 4. COORD AD OPS AND TAC PLAN CHANGES WITH AREA AND REGIONAL AD COMMANDS, SOF, & OTHER SERVICES AND ALLIES: a. JAAT b. JSEAD c. Employment of reserve d. Change in main effort e. AD asset reallocation or priorities 5. INTEGRATE AD OPS INTO OVERALL INTEL SYS, ICW G2 6.COORD UNIT MOVEMENT AND PSN OCCUPATION RQMT W/ G3 AND G4, RESPECTIVELY	ADE ADE ADE ADE/Ch FSC ADE/G2 ADE/G3
		UPDATE AIR SPACE CONTROL PROCEDURES	5. DEVELOP & MAINTAIN AIRSPACE USE & SITUATION OVERLAYS [878-8-AC03] PAGE 178 A2C2 Elem, COC	1. ACCURATELY PORTRAY AIRSPACE CONTROL MEASURES ON OVERLAYS, TO INCL: a. High density airspace control zone b. Coord altitude c. Restricted ops zone d. Min risk route e. Low level transit route f. Standard use Army aircraft flight route g. Base defense zone & wpn free zone h. Air corridor 2. UPDATE OVERLAYS AS REQUIRED	A2C2 Elem A2C2 Elem
		ID & RESOLVE AIRSPACE CONFLICTS	6. ID & RESOLVE AIRSPACE CONFLICTS [878-8-AC04] PAGE 5-179 A2C2 Elem, COC	1. SUPERIMPOSE OVERLAYS GEOGRAPHICALLY TO ID POTENTIAL CONFLICTS 2. RESOLVE CONFLICTS BY: a. Employ SOPs to establish procedural control b. Change time sequence c. Relocate airspace user or another element d. Establish airspace procedural control measures e. Eliminate or restrict operations of airspace users f. Accept risk 3. FORWARD CONFLICTS TO G3 TO EAC FOR RESOLUTION	A2C2 Elem A2C2 Elem A2C2 Elem
	B. COORD ATTACK MEANS	COORD AVN SPT UPDATE FS STATUS COORD W/ ALO FOR TAC AIR	1. COORD CURRENT OPS FS [006-8-FS04] PAGE 5-188 FSE, COC	1. MONITOR CURR SIT 2. COORD W/ FSC RE: FS CAPABILITIES, LIMITATIONS, & ORG FOR COMBAT a. Controlled supply rate (CSR) b. Unit locations c. Missions d. Fire support coordination measures e. Priority of fires 3. COORD SPECIAL RQMTS FOR EXECUTION/CHANGES TO NUC/CHEM FIRES W/ CHML OFF IN FSC 4. ENSURE FS INTEGRATED TO SPT OPS 5. COORD W/ FSC ON PLANS AND CHANGES TO PLAN, AS: a. JAAT msns b. JSEAD msns c. Employment of reserve d. Change in main effort e. Priority of FS f. Counterfires g. CAS msns	G3 COC/Ch FSC G3 COC/Ch FSC Ch FSC Ch FSC G3/Ch FSC

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
C. COORDINATE DEEP OPERATIONS [CON'T]	B. COORD ATTACK MEANS [CON'T]		2. COORD EW W/ FIRES [034-8-EW02] PAGE 5-205 EW SEC, FSC	1. COORD EW ASSET ALLOCATION W/ G2 & FSE 2. COORD HPT LCNS W/ FSE 3. COORD SCHEDULE OF JAMMING W/ APPROPRIATE STAFF 4. COORD RESTRICTED FREQUENT LIST W/ APPROPRIATE STAFF 5. COORD MECHANISM TO MEASURE EW EFFECTIVENESS TO OVERALL FS PLAN	EW/Ch FSC EW/Ch FSC EW/Ch FSC EW/Ch FSC EW/Ch FSC
			3. COORD EMPLOYMENT OF CHML WPNS [003-8-CM05] PAGE 5-202 CHML Sec, FSC	1. ASSIST G3 AUTHENTICATE CHML ORDERS & PROCESSING EMERGENCY ACTION MSGS 2. MONITOR DELIVERY OF CHML MUNITIONS W/IN PARAMETERS OF OPORD & EXECUTION ORDER 3. MONITOR CHEM WPN LOG a. Redistribution of prescribed chemical load and prescribed chemical stockage based on the tactical situation b. Monitor delivery system status, ICW FSE c. Coordinate w/ deception element 4. ASSIST FSE IN SELECTING CORPS ARTY ASSETS TO EMPLOY CHEM WPNS 5. ASSIST IN TGT SELECTION PROCESS a. Provide advice on potential chemical targets b. Recommend type and amount of chemical munitions to be used, time of attack, and weapons-delivery systems	G3/CHEM OFF CHEM OFF CHEM OFF CHEM OFF/FA TGT ANALYST CHEM OFF/FA TGT ANALYST
			4. COORD EMPLOYMENT OF NUC WPNS [006-8-FS11] PAGE 5-217 FSE, FSC	1. RECEIVE APPROVED NUCLEAR PACKAGE FROM EAC a. Update package and provide updated data to divisions b. Transmit nuclear warning order to divisions and supporting corps delivery units c. Coordinate w/ deception element for movement 2. EMPLOY NUCLEAR PACKAGE a. Redistribute prescribed nuclear load and prescribed nuclear stockage based on the tactical situation b. Execute only upon receipt of a properly authenticated EAM 3. PERFORM NUCLEAR POST STRIKE ANALYSIS a. Coordinate post strike reconnaissance request b. Record and analyze results of nuclear strike c. Conduct restrike, as required d. Report results of strike to Theater/Army	FSE FA TGT ANALYST FA TGT ANALYST
		COORD W/ ALO FOR TACAIR	5. COORD TAC AIR SPT [001-8-AL03] PAGE 5-198 ALO, FSC	1. ADVISE CDR AND STAFF ON TACAIR CAPABILITIES, LIMITATIONS, & EMPLOYMENT 2. COORD TACAIR EMPLOYMENT W/ G3, G3 AIR, FSE, AVN, ADE, SOCCE, & G2 INCL: a. CAS b. AI/BAI c. Recon & surveillance 3. SUPERVISE TACP 4. DIRECT CORPS ASOC 5. ESTABLISH & OPERATE AIR FORCE AIR REQUEST NET (AFARN) 6. PERFORM A2C2 DUTIES	ALO, ASOC ALO ALO ALO ALO ALO/ASOC

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
C. COORDINATE DEEP OPERATIONS [CON'T]	B. COORD ATTACK MEANS [CON'T]	COORD ARMY AVN SPT	6. COORD ARMY AVN EMPLOYMENT [001-8-AV03 PAGE 5-182 AVN SEC, COC	1. MONITOR OPERATIONAL STATUS OF AVN ASSETS a. Crew status b. Equipment status c. Aviation log status 2. ASSIGN UNIT RESPONSIBILITIES AND MSNS 3. COORD EMPLOYMENT OF AVN ASSETS W/ OTHER STAFF INCL: a. A2C2 b. FSE c. G4 d. ADE e. ALO f. SIGO g. TAC CP h. Rear CP i. G2 4. RECOMMEND CHANGES TO AVN EMPLOYMENT	AVN/AVN BDE/G3 PLANS AVN AVN/G3 Air AVN/G3 Air
		UPDATE STATUS OF JAAT OPS UPDATE STATUS OF JOINT AIR SUPPORT OPS	7. COORD ARMY AVN EMPLOYMENT W/FIRES [001-8-AV04] PAGE 5-200 AVN Sec, FSC	1. COORD JAAT RQMTS W/ FSE, TACP, ALO: a. Analyze IPB products b. Dtm task org of JAAT c. Dtm munitions to be employed d. Synchronize available assets into plan of attack e. Develop & disseminate plan 2. ID RQMTS FOR & COORD JSEAD W/FSE, TACP, G3 & G2 a. ID threat AD wpn systems that require suppression b. Dtm capabilities of JSEAD assets & planning considerations or msn assignments of these assets based on the threat c. Develop and disseminate JSEAD plan 3. COORD PREPLANNED FIRES W/ FSE a. Recommend task org of FS assets b. Synchronize fire support w/ scheme of maneuver 4. OBTAIN CAS & BAI TGTS FROM FSE AND/OR ALO/TACP a. Dtm allocation of CAS and BAI assets b. Synchronize engagement sequence of CAS and BAI execution of targets c. Receive current target list for CAS/BAI	AVN/Ch FSC/FSE/ ALO/EW/G3 PLANS AVN/Ch FSC/ALO/ EW/G3 PLANS AVN/Ch FSC/ALO/ EW/G3 PLANS AVN/Ch FSC/EW/ G3 PLANS
			8. COORD SPECIAL OPS EMPLOYMENT W/FIRES SOCCE, FSC	1. COORDINATE OPERATIONAL FIRES 2. DEVELOP COMMUNICATIONS WITHIN JSOA 3. DEVELOP JOINT OPERATIONAL FIRE SUPPORT PLAN	
		DEVELOP SUBORDINATE COMMAND VISIONS	9. REVIEW PLANS AND ORDERS OF SUBORD UNITS [878-8-3018] PAGE 5-114 G3, PLANS	1. REVIEW OPLAN/OPORD SUBMITTED BY SUBORD UNITS a. Ensure OPLAN/OPORD complies w/ corps OPLAN/OPORD b. ID discrepancies 2. COORDINATE W/ SUBORD UNITS AND COMMANDERS a. CLARIFY questions/issues in subord units OPLAN/OPORD b. Resolve identified discrepancies between OPLANS/OPORDS	G3 PLANS G3

APPENDIX D

SYNCHRONIZATION TASKS

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SYNCHRONIZE

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
S. SYNCHRONIZE DEEP OPERATIONS	A. COORD DEEP OPS PLANS TO ENSURE MUTUAL SUPPORT	UPDATE STATUS OF COLLECTION ACTIVITIES	1. PERFORM COLLECTION MANAGEMENT {030-8-2006} Page 5-81 G2, INTEL	1. DTM INFO THE CDR NEEDS TO KNOW CONCERNING THE ENEMY AND ENVIRONMENT a. consider the current friendly situation & commanders intent b. Uses ASPS developed probable enemy course of action (COA) c. ID NAI on the event template to confirm or deny probable enemy COA 2. PRIORITIZE RQMTS INTO PIR AND IR a. Receive intelligence collection requirements from other staff elements, higher & subordinate HQ b. Recommend PIR in coord w/ G3 & other staff elements c. Receive cdr's approval/disapproval of PIR 3. PREPARE COLLECTION PLAN a. Receive, analyze & prioritize the PIR & IR, & recommend changes in PIR to the CDR b. DTM indicators to answer each requirement c. DTM from the event template NAI & when to best look for indicators d. DTM specific info requirements (SIR) by translating indicators into missions; includes who is tasked, what they are to look for, where and when to look for e. Dtm reporting requirements f. Dtm collection asset capability/availability to collect against each SIR g. Select and task collection assets h. Evaluate reports by collection assets i. Update collection plan, as required j. Prepare collection plan in accordance w/ tactical SOP k. Coord w/ G5 & MP to obtain intel from civilian authorities 4. DISSEM INTEL RQMTS a. Use operation plan/operation order/fragmentary order process for organic collection requirements b. Transmit request for intelligence info (RII) to higher HQ for collection requirements beyond corps capabilities 5. MONITOR COLLECTION EFFORT a. Review data base & target overlays b. Dtm if priority intel requirements/info requirements data base and/or targeting data are being collected c. Compare PIR/IR to situation map & reporting to dtm if PIR/IR have been satisfied d. ID additional info needed to answer PIR/IR e. Update the plan as required 6. DIRECT EXECUTION OF TAC RECON/SURVEIL OPS ONCE COORD BY INTEL CELL THROUGH ASPS OR CORPS LO AT BCE a. Receive info b. Process info c. Disseminate info to appropriate staff section/subordinate units	G3 COC/G2 G2 G2 G2 G2 G2/G3

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
S. SYNCHRONIZE DEEP OPERATIONS [CON'T]	A. COORD DEEP OPS PLANS TO ENSURE MUTUAL SUPPORT [CON'T]		2. PLAN CIVIL-MIL OPS [041-8-5002] PAGE 5-117 G5, PLANS	1. EST CMOC 2. COORD W/ OTHER U.S., COALITION, & SPT'G CMOCs VIA LOs 3. PREPARE CA EST a. Provide capabilities/limitations of area resources available to support corps ops b. ID operational impact on local population c. Develops methodology to minimize local population interference in corps operations d. ID civil affairs deficiencies and recommends solutions 4. DEVEL CA ANNEX BASED ON EST 5. PROVIDE POP CENTER OVER- LAYS TO FSE FOR USE IN DRAFTING PRECLUSION OVERLAYS	G3 G3/G5 G5 G5 G5
	B. OPTIMIZE COMBAT POWER IN JOINT/ MULTI-SERVICE OPS (Target Wpn Pairing)		1. SYNC COMBAT OPS [878-8-3022] PAGE 5-148 F3, COC	1. CONDUCT DEEP OPS a. Allocate combat, combat support, combat service support assets to achieve the mission b. Effect future close operations in the corps favor c. Adjust deep operations as the tactical situation requires d. Coord and implements approved changes e. Dtm ICW G2 reattack requirements 2. MONITOR CLOSE OPS a. Reallocate combat, combat support and combat service support assets b. Recommend changes to commander based on changes in the tactical situation c. Coord and implement approved changes 3. MONITOR REAR OPS a. Provide the corps freedom of maneuver b. Provide the corps continuity of operations c. Reallocates assets/priorities, as required d. Monitor commitment of tactical combat force e. Maintain current rear situation f. Monitor corps terrain management 4. RECOMMEND COMMITMENT OF THE RESERVE a. Reallocate assets as required b. Reform a reserve as soon as possible 5. ENSURE THE TRANSITION FROM OPLAN TO EXECUTION (OPORD) IS IN SYNC W/ THE CORPS OPERATION BEING CONDUCTED AT THE TIME OF EXECUTION	G3/Ch FSC/ALO/ G2 G3/Ch FSC/ALO/ G2 G3/Ch FSC/ALO/ G2 G3 G3/Ch FSC/ALO/ G2
		DEVELOP & COORDINATE A2C2 TO SUPPORT OPS	2. SYNC A2C2 [878-8-3025] PAGE 5-153 G3, COC	1. REVIEW ARMY A2C2 PLAN a. Verify consistency w/ scheme of maneuver and commander's intent b. Revise the plan, as required. 2. MONITOR DISSEM OF A2C2 MEASURES BY A2C2 ELEM TO SUBORD, ADJACENT, AND HIGHER HQS 3. SUPERVISE A2C2 ELEM a. Update control measures as required b. Develop and maintain airspace use and situation maps/overlays to provide procedural and positive command and control c. ID and resolve airspace conflicts	G3/ADE G3/A2C2 ADE/G3

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
S. SYNCHRONIZE DEEP OPERATIONS [CON'T]	B. OPTIMIZE COMBAT POWER IN JOINT/ MULTI-SERVICE OPS (Target Wpn Pairing) [CON'T]	COORDINATE W/ ALO FOR TACAIR	3. SYNCHRONIZE JOINT AIR SPT OPS [878-8-3038] PAGE 5-194 G3 Air, FSC	1. RECOMMEND REVISION TO FS & MANEUVER PLANS a. Supervise A2C2 b. Coord w/ FSE for FS. c. Coord w/ corps avn officer for employment of attack helicopter forces d. Recommend avn task organization e. Coord w/ the ALO for AF assets f. Coord w/ SOCCE to deconflict targets 2. DIRECT EXECUTION OF BAI, JAAT, JSEAD a. Receive BDA b. Coord w/FSE for reattack if required. 3. DIRECT EXECUTION OF AIRLIFT OPS	G3 AIR/G3/Ch FSC G3 G3

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
S. SYNCHRONIZE DEEP OPERATIONS [CON'T]	B. OPTIMIZE COMBAT POWER IN JOINT/ MULTI-SERVICE OPS (Target Wpn Pairing) [CON'T]		4 SYNCHRONIZE FS OPS [006-8-FS07] Page 5-209 FSE, FSC	1. ADVISES CDR & STAFF ON FS ASSETS CAPABILITIES/LIMITATIONS/EMPLOYMENT 2. COORD W/ G2 IN TARGETING PROCESS a. Use high payoff target list to identify information for immediate dissemination b. Use target value analysis (TVA) to identify high value target (HVT) c. Recommend which HVT in enemy second echelon & follow-on forces should be attacked d. Recommend priority of HVT, degree of damage required, and primary and secondary attack assets e. Provide input to the corps collection plan, ICW G2 3. COORD OBSTACLE PLAN FS W/ EN SEC a. Integrate employment of scatterable mines, ICW FA, EN, & AF b. Verify obstacle are covered by FS assets to fullest extent possible 4. COORD NUCLEAR FIRES a. Specify nuclear command & control requirements b. Coordinates nuclear targeting & rules of engagement c. Monitor nuclear logistics plan, delivery systems, readiness, PNL & PAL d. Compare friendly unit lcn & status w/ safety criteria & nuc operational exposure guidance (OEG) e. Manage application of collateral damage constraints & assess impact on future ops f. Manages current status of nuclear preclusion areas ICW G3, G5 & NBC Center 5. COORD TACTICAL AIR SPT a. Verify number of CAS sorties distributed to the corps b. Verify CAS allocation to subordinate units. c. Confirm the not late than time for submitting preplanned requests to the BCE 6. COORD FIRE SPT W/ ARMY A2C2 ELEM 7. COORD AI a. DTM the corps AI nominations & BAI requests, ICW ALO & ASOC b. ID targets & target types as specifically as possible c. Assign priority & precedence to each nomination/request 8. COORD JAAT OPS a. Coord w/avn section for use of attack helicopters b. Coord w/ ALO for use of AF assets 9. COORD JSEAD OPS a. ID enemy air defense system ICW G2 b. Coord w/ avn section, ALO & G2 for the use of assets committed to JSEAD 10. RQST ADDITIONAL FS ASSETS FROM EAC/ARMY & AF AS REQUIRED 11. COORD CURRENT & PROJECTED CSRs FOR C/A UNITS W/ G3/G4 12. COORD COUNTERFIRE	Ch FSC/TGT ANALYST/ FAIO/ AFIO Ch FSC/TGT ANALYST TGT ANALYST Ch FSC/TACP/ALO TGT ANALYST TGT ANALYST/ALO Ch FSC/TACP/ AVN/ALO/A2C2 FSE/AVN/ALO/G2/ FAIO/TACP/A2C2 Ch FSC/ALO/G3 Ch FSC/G3/G4 Ch FSC

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
S. SYNCHRONIZE DEEP OPERATIONS [CON'T]	B. OPTIMIZE COMBAT POWER IN JOINT/ MULTI-SERVICE OPS (Target Wpn Pairing) [CON'T]		5. CONTROL PSYOPS [878-8-3023] PAGE 5-150 G3, COC	1. SUPERVISE PSYOP ELEM a. Coord w/ PSYOP units b. Implement established implementation schedule. 2. COORD W/ G5 a. Update susceptibilities and vulnerabilities of target population b. Update civilian population activities that may impact on corps tactical operations 3. COORD W/ G2 a. Provide estimates of effectiveness of PYSOP on enemy forces b. Provide recommended themes for development based on assessment of enemy vulnerability 4. RECOMMEND REALLOCATION OF PSYOP ASSETS a. Receive input from G5 and G2 b. Supports commanders intent c. Employs all assets	G3 G3/G5 G3/G2 G3
			6. CONTROL EW [878-8-3024] PAGE 5-152 G3, COC	1. PROVIDE DIRECTION TO THE EW EFFORT a. Dtm rqmts to support all EW activities b. Coord w/ G2 and fire support element concerning allocation of EW assets c. Recommend allocation of EW assets d. Assign EW missions through G2, collection management and dissemination section e. Advise commander on employment of directed energy weapons 2. PROVIDE GUIDANCE AND RECOMMENDATIONS TO G2 FOR ELECTRONIC SPT MEASURES	G3/EW EW
		UPDATE STATUS OF M/CM SITUATION (FRIENDLY)	7. INTEGRATE MOBILITY/COUNTER-MOBILITY/SURVIVABILITY OPS W/FIRES [005-8-EN05] PAGE 5-204 EN, FSC	1. COORD EN LCNS AND EFFORTS W/ FSE 2. COORD GATOR AND OTHER AIR DELIVERED OBSTACLES REQUEST W/ ALO & TACP 3. COORD ARMY AVN DELIVERED SCATTERABLE MINES W/ AVN LO 4. COORD OBSTACLE PLAN FIRE SPT W/ FSE 5. COORD SURVIVABILITY & PROTECTION OF FS ASSETS	FSE/EN/ALO/TACP Ch FSC EN/AVN EN/Ch FSC EN/Ch FSC
			8. SYNCHRONIZE SPECIAL OPERATIONS SOCCE, COC	1. PROVIDE LIAISON TEAMS 2. CONDUCT C3 OF JSOF OPERATIONAL ELEMENTS	

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APPENDIX E

EXECUTION TASKS

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EXECUTE

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
E. EXECUTION OF DEEP OPS PLAN	A. CONDUCT DEEP OPS/PERFORM TGT PROCESSING	UPDATE STATUS OF DEEP OPS SIT	1. CONTROL DEEP OPS [878-8-3027] Page 5-156 G3, COC	1. MONITOR ENEMY ACTIVITY IN CORPS AREA OF INTEREST ICW G2 a. ID relevant enemy forces not in contact which can interfere w/ corps close ops over the next 72 hours b. Dtm enemy vulnerability to deep attack c. Prioritize in terms of threat to corps ops 2. RECOMMEND COA FOR DEEP OP a. Allocate resources (cbt, CS, CSS) against prioritized list b. Conduct risk assessment c. Select time and place for deep attack d. Verify COA supports cdr's intent e. Verify COA is mutually supportive of close and rear ops f. Deconflict w/ close and rear ops rqmts g. Recommend reallocation of corps' collection assets ICW G2 h. Recv priority of EAC collection/atk sys (for deep maneuvr) i. Fully integrate sensors, processors, atk means, C2 & commo 3. IMPLEMENT CDR'S DECISION FOR DEEP ATTACK a. Coord req'd cbt, CS, CSS b. Coord JSEAD for all deep op involv'g Army avn or AF assets c. Supervise deep atk execution 4. ASSESS DEEP OPS RESULTS a. Conduct TDA/BDA to dtm future enemy actions/capabilities, ICW G2 b. Recommend reallocation of deep ops assets c. Recommend changes to close ops, as needed, based on degree of success of deep ops	Ch FSC/G3 COC/G2/ ALO/Avn Off G3
			2. USE EMERGENCY ACTIONS PROCEDURES SYS & ASSOCIATED SUBSYSTEMS [878-8-3030] Page 5-161 G3, COC	1. MAINT CURRENT EMERGENCY ACTION PROCEDURES, CODES, AUTHENTICATORS 2. VERIFY SUFFICIENT EAP TRAINED PERSONNEL ARE AVAILABLE a. Maintains 24 hour a day capability b. Each two-person team includes a decision-maker 3. EST & MAINT CORPS' INTERNAL DISSEMINATION SYS 4. ENSURE FULLY OPNL EA TEAM W/ AUTHENTICATORS IS PRESENT AT THE TAC CP PRIOR TO RELOCATING MAIN CP 5. RECEIVE/AUTHENTICATE NUCLEAR CONTROL ORDERS; PROCESS EAM W/IN TIME STANDARDS IN TSOP 6. TRANSMIT AUTHORITY TO EXPEND NUC WPNS TO SUBORD UNITS, IAW CDR'S INTENT	G3 COC/TGTING TM G3 COC G3 COC G3 COC G3 COC/Ch FSC G3

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
E. EXECUTION OF DEEP OPS PLAN [CON'T]	A. CONDUCT DEEP OPS/PERFORM TGT PROCESSING [CON'T]	PREPARE FRAG ORDER	3. DEVEL FRAG ORDERS [878-8-3033] Page 5-166 G3, COC	1. RECEIVE CDR'S GUIDANCE 2. MODIFY CONPLAN IAW CDR'S GUIDANCE 3. COORD CHANGES W/ OTHER STAFF ELEMS IN CORPS TAC 4. PREPARE FRAGO a. Address each CDR required to take actions b. Indicate task organization changes c. Include only inf. that has changed from the operation order being executed d. Ensure a copy is sent to higher & adjacent HQ for inf. purposes e. Ensure the order is distributed 5. COORD W/ TAC & REAR CPS a. Provide inf. on tactical plan adjustment b. Direct reforming of reserve, if required	G3/Ch FSC/AVN/ALO G3/Ch FSC/AVN G3/Ch FSC/AVN G3 G3/Ch FSC
			4.IMPLEMENT CONPLANS [878-8-3035] Page 5-169 G3, COC	1. COORD W/ G3 PLANS IN DEVELOPING CONPLANS a. Receive war gamed results of branches & sequels b. Formulate contingency plans 2. BRIEF CDR ON CONPLAN a. CDR issues guidance/directs changes b. Cdr's guidance incorporated into CONPLAN c. Specify criteria for implementation 3. ISSUE CONPLANS TO SUBORD, HIGHER, ADJACENT HQS 4. RECV IMPLEMENTING DECISION a. Threshold conditions for CONPLAN are met b. Modify CONPLAN, as required 5. DIRECT CONPLAN IMPLEMENTATION 6. MONITOR SITUATION	G3/Ch FSC/G3 COC/ G3 Plans/G3 Air/AVN G3/Ch FSC/G3 COC/AVN/ ALO G3 G3 G3 G3/Ch FSC/G3/COC/AVN
			5. OPERATE FIRE SUPPORT COORDINATION FACILITIES [006-8-FS06] Page 5-208 FSE, FSC	1. OPERATE THE TAC, MAIN, & REAR FS FACILITIES 2. ADVISE CDR AND G3 ON FS OPS, CAPABILITIES AND LIMITATIONS 3. INFORM CDR AND G3 OF SYSTEM AVAILABILITY 4. RECOMMEND CHANGES TO THE FS ORG FOR COMBAT 5. ADVISE CDR & G3 ON BATTLEFIELD NUCLEAR WARFARE & CHML a. Provide nuc vulnerability analysis of division & separate brigade size units b. Advise on survivability & mitigation considerations for the corps	Ch FSC/FSE Ch FSC/FSE Ch FSC/FSE Ch FSC/FSE Ch FSC/FSE
		PROCESS TARGET ATTACK	6. PROCESS TGT ATTACK [006-8-FS09] Page 5-214 FSE, FSC	1. EXPEDITE IMMEDIATE FS REQUESTS 2. EXPEDITE PROCESSING OF PLANNING FIRES 3. ATTACK HIGH PAYOFF TARGETS IDENTIFIED IN TARGET ANALYSIS 4. ORDER THE EXECUTION OF JAAT OPS 5. ORDER THE EXECUTION OF LOCALIZED JSEAD & CAMPAIGN JSEAD AS REQUIRED 6. ORDER COUNTERFIRE IAW CDR'S INTENT	TGT ANALYST TGT ANALYST Ch FSC/ALO/AVN/EN/FSE Ch FSC/ALO/AVN/EN Ch FSC/ALO/AVN/EN Ch FSC

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
E. EXECUTION OF DEEP OPS PLAN [CON'T]	A. CONDUCT DEEP OPS/PERFORM TGT PROCESSING [CON'T]	PERFORM TARGET ANALYSIS	7. COORD TGT ATTACK [006-8-FS08] Page 5-212 FSE, FSC	1. PERFORM TGT ANALYSIS a. Non-nuclear b. Nuclear c. Chemical 2. PROVIDE TGT INFO TO ATTACK ASSETS 3. CONTINUOUSLY COORD TGT INTEL INFO & TGT PRODUCTION FOR TIMELY & ACCURATE ENGAGEMENT a. Maintain appropriate standing request for info w/ tactical operations center b. Request specific target info from tactical ops center to support planning c. Maintain appropriate message of interest file 4. COORD W/ OTHER TGT ATTACK SUPPORTING AGENCIES a. Coord w/ ALO, AVN, SOCCE & other attack assets as needed to eliminate duplication of effort b. Coord time & sequence of attack w/ other FS assets c. Rqst additional attack assets as needed, from reinforcing units, AF, SOF, & other supporting agencies, as appropriate 5. Rqst TDA from G2 a. Obtain enemy casualty figure b. Rqst vehicle & facility damage estimate c. Additional key effects achieved on targets d. Evaluation of overall effect & recommendation for restrike 6. RECOMMEND CHANGES TO CRITERIA AS REQUIRED 7. MAINT STATUS OF FRIENDLY LCNs & FSCMs a. FS situation map b. FS unit data file c. Appropriate message of interest file at the TOC	TGT ANALYST TGTING TM TGTING TM/FAIO/AFIO/ G3 COC TGTING TM/FAIO/AFIO/ G3 COC Ch FSC/ALO/AVN/ TGTING TM TGTING TM Ch FSC/G3 COC/TGT'G TM
	B. RECEIVE REPORTS/MONITOR SITUATION		1. DIRECT INTEL OPS [030-8-2009] Page 5-139 G2, COC	1. REVIEW CURR & FUTURE RQMTS a. Monitor the current and projected enemy situation/COA b. Recommend changes to PIR c. Recommend changes to IR d. Recommend changes to MI org for combat, as required, ICW G3 2. SUPERVISE CM&D IN ITS INTEL ACQUISITION a. Supervise execution of intelligence acquisition tasks by corps units b. Monitor status of requests for intelligence info (RII) c. Initiates new RII, as required 3. SUPERVISE EXPLOITATION OF CAPTURED PERSONNEL, DOCUMENTS, & MATERIAL IAW PIR/IR 4. SUPERVISE COUNTER INTELLIGENCE (CI) FOR CORPS OPS a. Monitor preparation of CI est b. Monitor development of CI data base c. Monitor execution of CI support plan d. Modify CI support of plan, as required 5. DIR WEATHER SPT FOR CURRENT/FUTURE OPS 6. DIR TOPOGRAPHIC SPT FOR CURRENT/FUTURE OPS 7. DIR EW SPT MEASURES COLLECTION EFFORT IN SPT OF EW, ICW G3 8. COORD INTEL EFFORT AMONG TAC, MAIN, AND REAR CPs 9. CONTROL RELEASE OF ALL INTEL PRODUCTS	G2/G3 G2 G2 G2 G2/SWO G2/EN G2/EW G2 G2

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
E. EXECUTION OF DEEP OPS PLAN [CON'T]	B. RECEIVE REPORTS/MONITOR SITUATION [CON'T]		2. DISSEMINATE COMBAT INFORMATION AND INTEL [030-8-2005] PAGE 5-79 G2, INTEL	1. DISSEM COMBAT INFO TO CDR & STAFF a. Disseminate highly perishable combat info in spot report format immediately after receipt b. Disseminate info to other staff elements in CTOC based on their need 2. DISSEM INTEL a. Disseminate intelligence to higher, lower, & adjacent HQ by the most expeditious means available b. Disseminate intelligence to other staff elements in CTOC, based on their needs c. Disseminate intelligence to tactical & rear command posts as it is developed 3. DISSEM INTSUM, IAW TSOP a. Provide brief summary of info of intelligence interest covering a prescribed time b. Provide summary of enemy situation in forward & rear areas, enemy operations & capabilities, & weather/terrrain characteristics c. Reflect interpretations & conclusions of enemy capabilities & probable COA	G2 INTEL CELL G2 INTEL CELL G2 INTEL CELL
		DISSEMINATE AIRSPACE CONTROL ANNEX, CONTROL ORDER TASKING ORDER	3. REQUEST, MAINTAIN, & DISSEMINATE A2C2 MEASURES OR RESTRICTIONS [878-8-AC02] PAGE 5-176 A2C2 Elem, COC	1. PROCESS RQST FOR AIRSPACE CONTROL MEASURES & RESTRICTIONS a. Include, minimally, location lateral & vertical limits & time period covered b. Ensure request is necessitated by need to reserve airspace for specific users, restrict or control actions, or require specific actions be taken by airspace users c. Ensure requests are approved by proper airspace control authority d. Ensure requests are based on coord altitude, SOPs & graphics, FSCMs & air defense ROEs 2. CANCEL OR CHANGE MEASURES & RESTRICTIONS TO FIT THE TAC SIT 3. DISSEM MEASURES AND RESTRICTIONS a. JINTACCS, U.S. & NATO msg formats b. Airspace tasking order c. Airspace control annex, w/ overlay, to OPLAN/OPORD	A2C2 ELEM, ALO, G3 AIR ADE G3/A2C2 Elem G3
	C. CONTROL ATTACK MEANS	UPDATE STATUS OF ENEMY SIT	1. CONTROL EN SPT [878-8-3026] Page 5-154 G3, COC	1. VERIFY ENGINEER ACTIVITIES SPT CONCEPT OF OPS 2. MONITOR EXECUTION OF OBSTACLE PLAN 3. REVIEW RECOMMENDATIONS FOR CHANGES FROM CORPS EN a. Priorities for asset allocation b. FASCAM allocation/employment c. Requirements for augmentation d. Task Organization 4. PROVIDE CDR'S & MSN GUIDANCE TO ASSISTANT CORPS EN 5. APPROVE ASSISTANT CORPS EN PLAN FOR EN SPT a. Obstacles b. Priority of engineer support c. Tasks organization	G3 COC/EN G3/Ch FSC/G3 COC Ch FSC/G3 COC G3 G3

FUNCTION	PROCESSES	TASKS		SUBTASKS/SUB-SUBTASKS	WHO
		C2NET TASK	ARTEP 100-15-MTP		
E. EXECUTION OF DEEP OPS PLAN [CON'T]	C. CONTROL ATTACK MEANS [CON'T]		2. CONTROL C3CM ACTIVITIES [878-8-3032] Page 5-163 G3, COC	1. VERIFY C3CM FOCUS a. Review cdr's concept b. Review enemy intel & counter C3 capabilities c. Review corps characteristics vulnerable to enemy intel & counter C3 actions d. Ascertain if changes have been made to the EAC C3CM plan 2. IMPLEMENT DECEPTION MEASURES a. Verify enemy desired action/nonaction b. Verify the deception story is still credible c. Direct friendly actions to convey the deception story 3. IMPLEMENT FIRES &/OR JAMMING TO DEGRADE ENEMY C3 SYSTEMS a. Attack critical enemy command, control, communications & intel nodes b. Attack high payoff targets 4. VERIFY EEFI 5. IMPLEMENT FORCE PROTECTION MEASURES a. Coord attacks by fire w/ FSE b. Monitor jamming to minimize disruption of friendly C3 systems c. Coord cross-service electronic warfare support, reconnaissance & surveillance w/ the BCE 6. IMPLEMENT OPSEC MEASURES TO DENY ENEMY TGT'G INFO a. Deception b. False command posts c. False communications networks d. Forward jamming 7. IMPLEMENT COUNTER C3 a. Jamming between critical enemy C2 nodes b. Fires against enemy sensors, command posts, & communications nodes 8. IMPLEMENT CORPS' C2 PROTECTION MEASURES a. Reduce C2 node signature b. Locate C2 facilities in hardened structures or excavated emplacements c. Disrupt enemy collection capabilities by screening & forward jamming d. Include dummy facilities e. Include destruction of enemy collection & FS assets	EW/G3 Ch FSC/EW/G3 COC Ch FSC/AVN/G3 COC/ALO G3/Ch FSC G3/Ch FSC/ALO G3/SIGO/EW G3/SIGO/EW G3/SIGO/EW
		COORDINATE AD OPS W/IN AREA & REGIONAL COMMANDS	3. CONTROL AD OPS [878-8-3034] Page 5-168 G3, COC	1. MONITOR AD RULES AND PROCEDURES a. Rules of engagement b. Hostile criteria c. Wpns control measures d. Airspace control measures e. Defense readiness conditions f. Air defense warnings 2. COORD CHANGES IN PRIORITIES FOR SPT 3. COORD REALLOCATION OF AD ASSETS	G3 COC/ADE/A2C2/AVN/ ALO G3 COC/ADE G3 COC/ADE

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APPENDIX F

DOCTRINAL STAFF

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APPENDIX F

DOCTRINAL STAFF

F-1. Introduction. The primary function of the main corps CP is to synchronize the close, deep, and rear operations; conduct deep operations; plan for future operations; and coordinate CSS for overall operations [FM 100-15-1, *Corps Operations, Tactics and Techniques*, September 1992 Coordinating Draft]. The main CP contains six doctrinal cells deployed in four physical locations. Each of the four locations (cells, figure F-1) perform deep operations C2 functions.

F-2. Corps main command post cells/deep operations functions.

a. The headquarters/current operations cell (COC) is the operations integration center where all data inputs from other cells of the main, TAC, and rear CPs are collected and fused into the operational and support activities and plans of the corps. The primary function of the COC is to ensure synchronization of close, deep, and rear operations. This cell is a multifunctional cell, composed of representation from all BFAs. Other COC major deep operations functions are:

(1) G2.
- Perform intelligence functions for deep operations.
- In coordination with the G3 and FSE, participate in the decide-detect-deliver targeting process.

(2) G3.
- Synchronize combat, CS, and CSS in support of close and deep operations.
- Synchronize corps current (close, deep, rear) operations.
- Control deep maneuver operations.
- Direct the A2C2 element collocated with the FSC.
- Monitor SOF operations.

(3) FS.
- Monitor and assess current operations and provide close, deep, and rear fire support information to the FSC.

b. The intelligence cell is responsible for intelligence collection management, all-source intelligence production, and dissemination in support of current and future operations. It conducts continuous IPB to support future operations planning and provides the basis for target development. As part of the deep targeting process, this cell implements the collection plan and notifies the FSC and COC when high-payoff targets are detected and tracked.

c. The FSC is responsible for planning and integration of all types of fires for current and future operations and for controlling all deep fires as part of the delivery function of deep targeting. This multifunctional cell ensures the integration of field artillery, Air Force, Army aviation, air defense, and EW. It coordinates the use of airspace with the corps A2C2 element

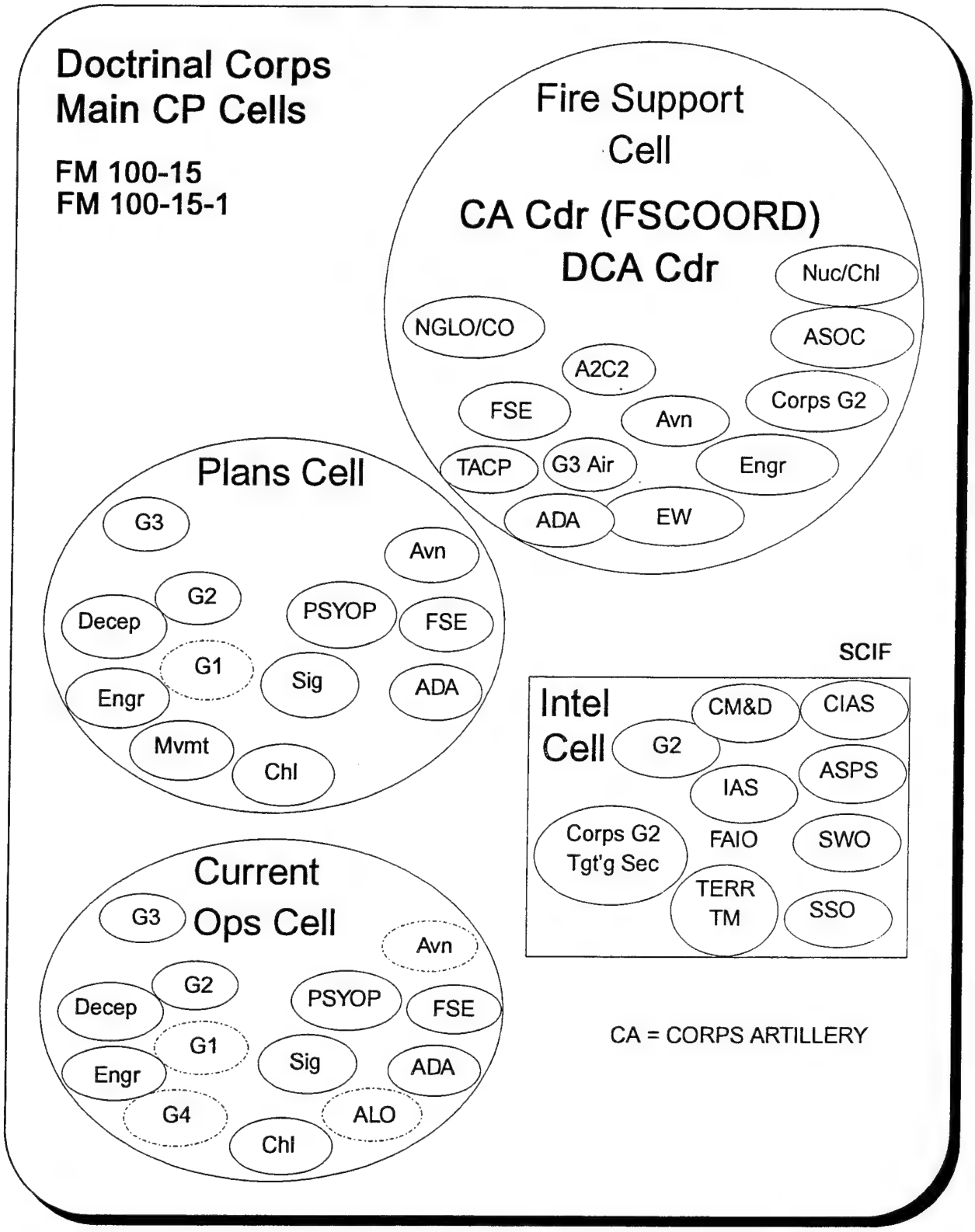

Figure F-1. Doctrinal corps main command post cells

and Air Force support through the ASOC/tactical air control party (TACP), interacts with the COC and TAC CP to ensure FS assets are maximized for current operations, provides representation in the plans cell to integrate FS into future operations, and controls lethal and non-lethal deep fires. Other major FSC deep operations functions are:

(1) To coordinate TACAIR employment in support of corps operations and develop prioritized BAI missions and target lists.

(2) To coordinate J-SEAD, JAAT, joint attack of artillery (JAART), and FS of SOF operations, as required.

(3) To coordinate FS of command, control, communications countermeasures (C3CM) operations to include jamming or destruction of C3I nodes and support of deception operations.

d. The plans/CSS cell remains abreast of the current situation while concentrating on planning future operations. This cell's primary responsibility is to plan future close, deep, and rear operations as sequels to current corps operations. The cell works in conjunction with the FSC and intelligence cell to determine high-payoff targets and develop detection and engagement concepts to find and attack these targets. Other major plans cell deep operations functions are:

(1) G2.
- Use IPB products in planning future operations.
- Ensure intelligence requirements to support future operations are identified early in the planning cycle, levied for collection, and satisfied in time to meet planning timelines.
- Coordinate with G3 Plans officer and FSE to identify early in the planning process high-value/high-payoff targets and ensure that collection requirements are passed to the intelligence cell for action.

(2) G3.
- Plan future close, deep, and rear operations.
- Develop COAs for future operations.
- Develop detection and delivery concepts to support deep operations in coordination with other members of the targeting team.
- Determine high-payoff targets for deep operations.

(3) AV.
- Plan aviation operations in support of future operations.

(4) FS.
-Integrate and synchronize all FS assets and requirements during plan development to meet commander's intent for FS.

F-3. Corps deep operations targeting team. The corps commander gains maximum advantage in the close fight by achieving success in the deep fight. He is concerned with accurately

identifying the most dangerous threat to his close fight. Using combinations of lethal and non-lethal systems, he delays and/or disrupts the enemy's follow-on forces.

a. The responsibility of the FSCOORD requires close coordination with the necessary staff agencies involved in targeting/deep operations planning and execution. Within the FSC, dedicated personnel are involved in targeting on a full-time basis and serve as the nucleus for the deep targeting team. These permanent staff members, and those required staff agencies from other cells, are brought together to develop a plan to accomplish the mission within the commander's planning guidance and intent. The G2 Plans, G3 Plans, and FSCOORD provide the necessary guidance and direction for the targeting team effort. Other personnel and agencies in the targeting team are:

- Corps deputy FSCOORD
- G2 operations representative
- G3 operations representative
- FAIO
- Targeting officer from the FSE
- Intelligence analysts from the CTOCSE (ACE)
- Fighter LNO
- USAF intelligence officer
- Engineer officer
- EW officer
- Chemical officer
- Air defense officer
- G3 air
- Corps aviation representative
- G4 representative

b. Target list development is based upon the COA selected by the corps commander. The targeting team will develop target sets, timelines, priorities, and planning considerations. Since the FSC is actively involved in the targeting process on a full-time basis, it is recommended that the targeting team conduct its planning meetings in this cell. This is where most of the key staff agencies are located to expeditiously facilitate the necessary coordination for deep target planning. The other staff elements of the targeting team should also meet here for refinement of deep operations COAs.

F-4. Commitment of corps aviation attack assets.

a. The corps commander, in his decision to commit aviation assets to attack a deep target, has implied that this target set is his highest priority target and the commitment of the aviation assets will produce results that cannot be achieved by any other attack means or COA. Aviation operations will require the concerted efforts of the entire corps main CP staff to coordinate and synchronize. Since the commander will normally position himself where he can best influence the battle, he will probably be at the main CP during the execution of this operation.

b. This operation will require special consideration for control, specifically the synchronization of other corps assets, subordinate maneuver units, adjacent units, EAC supporting assets, and the assets of supporting services. The extensive coordination and synchronization requirement for cross-FLOT aviation maneuver is beyond the capability of the aviation brigade staff. The control and synchronization of supporting actions (J-SEAD, FA support, TACAIR, EW, etc.) must remain with the corps main CP.

c. In order to command and control the aviation cross-FLOT operation, the corps commander may decide to establish an ad hoc organization to focus exclusively on this operation. It will control the execution of the operation, ensuring synchronization of activities and adjustment as necessary. This group should consist of the CoS, G3 plans officer, G3 current operations officer, aviation brigade S3, G2, FSCOORD, and additional staff officers as required (ADA, A2C2, EW, ALO, etc.). Locating this group in a particular cell is based on: location of key players, sufficiency of communications, other ongoing activities, and the commander's judgment.

d. Attacking enemy follow-on echelons is one of the missions of the attack helicopter battalions (ATKHB) found in the attack helicopter regiment of the corps aviation battalion. ATKHBs conducting a deep operation will normally operate at night, require 24 to 48 hours planning time, and require highly accurate and timely intelligence prior to and during the mission. Deep operations planning and execution is normally conducted at or near the corps main CP. A technique to accomplish this is to collocate the corps aviation brigade TAC with the G3 current operations cell and the corps intelligence cell.

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APPENDIX G

III CORPS STAFF

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APPENDIX G

III CORPS DEEP OPERATIONS STAFF

G-1. Introduction.

a. III Corps deep operations are those activities which are directed against enemy forces not currently engaged in close operations, but capable of engaging or influencing future close operations. III Corps combines maneuver, fire support, and/or C3CM to execute deep operations. Deep operations are not simply the corps attacking an enemy force in depth. They are the sum of all activities that influence when, where, and in what condition the enemy forces can be committed against corps' close and rear areas. The objective of deep operations is to isolate the enemy and set the conditions necessary for success in the close battle. Deep operations against enemy forces not yet in contact establish these conditions by stripping away the enemy's ability to concentrate combat power, attack in depth, and mass his artillery.

b. III Corps artillery has primary responsibility to conduct deep operations planning and execution in support of III Corps operations. Most, if not all, intelligence and targeting data will come from the corps ACE. They disseminate target information to the corps artillery FSC with the assistance of the FAIOs. The corps artillery G2 is responsible to obtain targetable intelligence information (target development is his most important function) from the corps G2 and ACE and disseminate it throughout the fire support community. He must ensure that the deep operations planning [targeting] and execution cells and the FSE have the intelligence needed to plan and conduct deep operations. There is little original information generated by the corps artillery G2.

G-2. III Corps deep operations cells (figure G-1).

a. Corps targeting team. Corps targeting team principals are the CG, G2, G3, and the corps artillery CG (as the corps FSCOORD).

b. The deep operations planning cell is located within the FSC and headed by the G3 deep operations planner. He drafts the deep operations plan based on deep operations tasks from the overall corps plan and commander's intent. The initial plan is drafted 96 hours out. At 72 hours out, a FRAGO is developed and released for coordination. The plan is refined/modified every 24 hours (paragraph G-4).

c. The DOTC is an element of the FSE within the FSC. The DOTC is the target planning nerve center and lead targeting agency within the corps staff at the action officer level. The DOTC integrates, manages, consolidates, orchestrates, and disseminates corps integrated target planning and attack recommendations for employment of corps deep attack assets against corps commander approved high priority targets high-payoff targets in accordance with the commander's intent. Through "back briefs" to their corps staff and division staff principals, these individuals keep the corps targeting efforts fully synchronized.

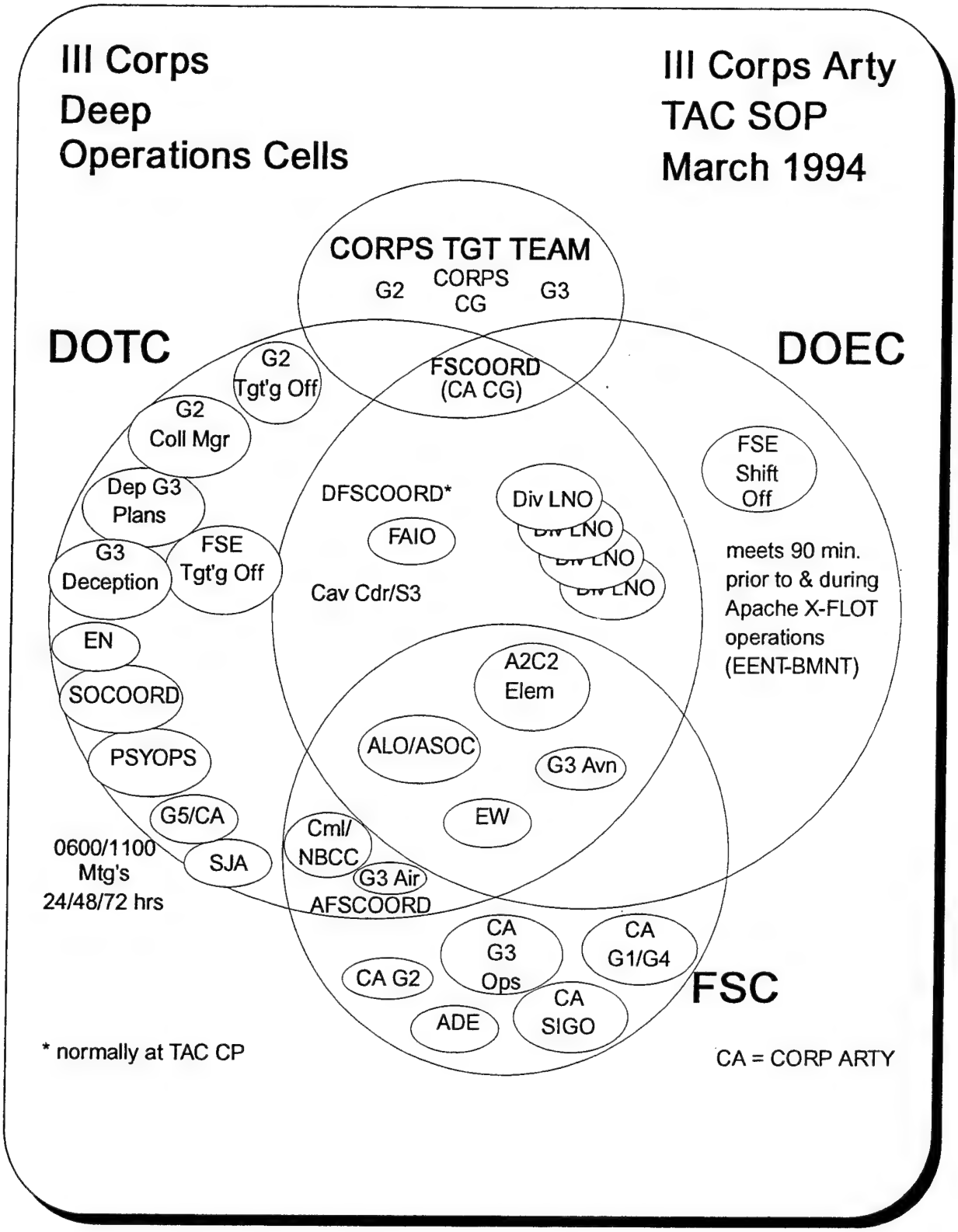


Figure G-1. III Corps deep operations cells

d. The DOEC is the second element of the FSE of the FSC. The DOEC meets in the FSC daily 90 minutes prior to cross-FLOT deep operations to command, control, and execute the attack aviation helicopters, which normally only attack only during the hours of darkness. AH-64 deep attacks are monitored and controlled directly by the cavalry commander from this cell.

e. FSC. The corps FSC is the focal point for the planning, integration, and coordination for the execution of deep operations. The FSC consists of the corps A2C2 element, ADE, ASOC, corps artillery G3 operations, corps artillery G2, corps G3 air, corps G3 aviation, corps EW, corps chemical, and corps artillery SIGO. The corps artillery commander (FSCOORD) and air fire support coordinator (AFSCOORD) work out of the FSC. Within the FSC, the FSE conducts fire support planning through the continuing and concurrent processes of acquiring and analyzing targets, recommending the allocation of lethal and non-lethal fire support means to targets, and synchronizing all available fire support to achieve the commander's intent.

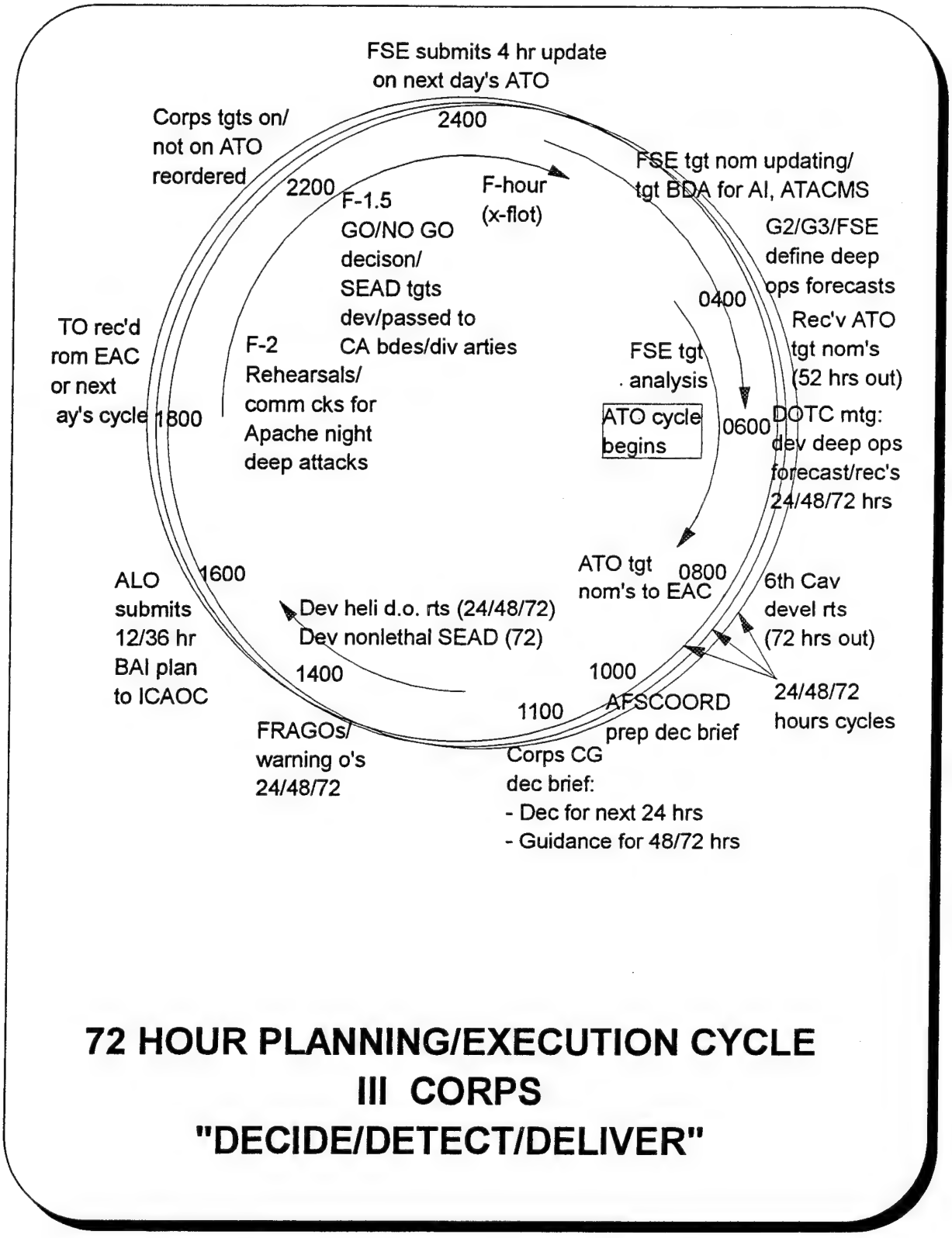
G-3. III Corps deep operations execution. The III Corps artillery commander executes deep operations planning and execution through his special staff position as the III Corps Commander's FSCOORD. He commands the corps artillery to support deep operations and integrates the many diverse and dynamic corps staff agencies to synchronize the planning, execution, and assessments of corps deep operations. Based on the corps commander's decision on a COA and receipt of the corps commander's guidance for the content of the commander's intent for fires, the FSCOORD drafts a proposed intent for fires which includes a deep operations focus for the corps commander's approval.

G-4. III Corps daily targeting and deep operations cycle. The corps targeting and deep operations planning/execution cycle (figure G-2) covers 72 hours and represents a continuous process of decide, detect, and deliver. III Corps organizes its 24-hour targeting and deep operations planning/execution cycles around the ATO time periods (0600 today to 0559 (local time) tomorrow). The following sequence of events represents a typical day in corps deep operations targeting, planning, and execution.

- 0600-0559: Deep operations work day begins at 0600 when a new ATO goes into effect. FSE/deep operations monitors, validates, updates (ordnance and target change - eight hours prior/refine target locations - four hours prior), and monitors corps air interdiction missions throughout the day.

- 0400-0530: G2, G3, and FSE wargame enemy and friendly actions, rates of march, etc., to give definition to the deep operations forecasts that will be presented at 0600 and 1100 deep operations meetings.

- 0400: Target nominations for ATO cycle beginning 52 hours out are received from III Corps divisions, G2/ASPS, and military intelligence (MI) brigade. FSE target analysis and prioritization begins and concludes at 0800 when submitted to Army headquarters/LCC/BCE for incorporation into two-day out ATO.



72 HOUR PLANNING/EXECUTION CYCLE
III CORPS
"DECIDE/DETECT/DELIVER"

Figure G-2. III Corps ATO cycle, 0600-0559

- 0600: DOTC meeting develops deep operations forecasts and recommendations for 24, 48, and 72 hours; updates plans/missions/tasks for this evening's Apache deep attack mission; and reviews plans/missions/tasks for next two nights. 1100 decision brief products reviewed and finalized for production. ATO cycle begins.

- 0800: Corps FSE submits target nominations to EAC and BCE. Update/create target lists. 6th Cavalry Brigade begins route development for mission 72 hours out.

- 0900: DOTC completes backbrief of 0600 targeting meeting results to corps staff principals. Staff principals pass inputs/disconnects to AFSCOORD for incorporation into 1100 deep operations decision brief.

- 1000: All deep operations decision brief products provided to AFSCOORD.

- 1100: Deep operations decision brief to corps targeting team (CG, G2, G3, FSCOORD). Results in deep attack assets employment decisions for next 24 hours and planning guidance for 48- and 72-hour planning cycles.

- 1230-1515: Helicopter deep attack routes are developed for each 24-hour period based on CG's guidance. Development of non-lethal SEAD plan must occur and be requested beginning 72 hours out to ensure USAF support; these are refined after each 1100 hours meeting.

- 1400: Warning orders/FRAGOs and guidance disseminated as a result of 1100 corps deep operations decision briefing.

- X-FLOT (F-Hour) minus 2 hours: Conduct rehearsal of all communication nets and execution of aviation deep operations.

- X-FLOT minus 90 minutes: Latest commander's critical decision criteria review for "GO/NO GO" decision by corps CG for deep attack launch. SEAD targets developed by G2/ASPS/FAIOs. FSE plans fires and prepares SEAD program/ schedule. SEAD targets passed to corps artillery brigades and division artilleries 90 minutes prior to execution (earliest X-FLOT will occur after EENT). Targets updated up to F-hour minus 15 minutes. DOEC forms at FSC.

- 1800-2000: ATO for following day received from EAC.

- EENT-BMNT: Corps attack helicopter deep operations/attack execution.

- 2200: Corps targets on ATO and corps targets not on ATO analyzed for redirection/ reordering of priorities for Air (Force) interdiction (AI) strikes. FSE submits first eight-hour target (for change of ordnance) updates for AI packages/ targets on next day's ATO (which begins at 0600).

- 2230: FSE notifies division main FSEs of which division target nominations do/do not appear on the ATO.

- 2400 FSE submits four hour update for first corps AI packages on next day's ATO.

- 0100-0600: FSE targeting personnel perform data base management functions on target nominations and target BDA for AI, ATACMS, etc. 0600 DOTC briefing slides being prepared.

- 0500: AI mission chart (displaying all scheduled AI packages, against what targets by ordnance) completed for next day's ATO (beginning at 0600).

- 0559: Deep operations cycle ends with completion of ATO cycle.

APPENDIX H

V CORPS STAFF

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APPENDIX H

V CORPS DEEP OPERATIONS STAFF

H-1. Introduction.

a. V Corps conducts deep operations to isolate the current, close battle and to create the conditions necessary for the success of close operations. This is achieved by focusing on enemy forces not yet in contact. This allows for:

(1) Stripping the enemy's ability to concentrate combat power and attack in depth,

(2) Creating the opportunity to defeat enemy forces one echelon at a time,

(3) Influencing where and when future fights occur, and

(4) Providing the ability to fight outnumbered and win.

b. The V Corps CG has developed a deep operations team and integrated it into the FSC. He designated the corps artillery commander (FSCOORD) as the "deep division commander" and reorganized the corps FSE into a DOC within the FSC and an FSE cell within the corps plans cell. The DOC serves to emphasize the importance of deep operations and to facilitate the coordination and synchronization of planning and execution.

c. Planning and coordination. Having considered the intent and missions of the commanders up to two levels above him, the corps CG develops his own intent and verbalizes it to his chief of staff, FSCOORD, G2, and G3. A concept of operation evolves from this intent and is used by the corps G3 plans, corps G2 plans, and FSE plans to develop OPLANs that include a concept for deep operations employment.

(1) The corps G2 begins the IPB with the purpose of determining the earliest time and place to attack the enemy.

(2) The aviation commander conducts a detailed analysis of the terrain to determine engagement areas (EA), battle positions, routes, and tactics to best attack the enemy. The corps' offensive air support (OAS) requirements are outlined and a hard copy of these requirements are submitted for inclusion into the corps' assessment report (ASSESSREP).

(3) The A2C2 and ADE begin deconflicting air routes and determining air defense weapon control measures.

(4) The targeting section of the DOC focuses its efforts against enemy ADA. Once ADA targets are identified, the targeting officer develops the SEAD program and passes it to the corps artillery COC for execution.

H-2. V Corps deep operations cells (figure H-1).

a. Plans cell.

(1) G2. The G2 ensures that intelligence collection and analysis are properly focused on enemy activities that impact on deep operations. Finished products from the corps G2 all-source production branch (ASPB) are disseminated to the corps artillery G2 for application in deep operations missions. Very little "raw" intelligence is forwarded to the DOC. The G2 Plans works/coordinates with the CTOCSE (ACE). As part of corps planning, he provides information of the enemy situation, historical data on the area, terrain, and weather. He learns from the CTOCSE what they know and, more importantly, what they do not know, about the enemy. He writes the intelligence annex to the corps OPLAN; drafts/coordinates PIR/IR with CTOCSE and obtains G2 approval; develops/coordinates possible, probable, and most dangerous enemy course of action (ENCOA) with CTOCSE; and assists G3 plans and FSE plans determine the scheme of maneuver.

(2) G3. The G3 develops and transmits the commander's intent and concept of operation for rear, close, and deep operations to the corps operations and plans elements and appropriate executing agencies. The G3 Plans conduct mission analysis and develops and wargames COAs and scheme of maneuver. He prepares OPLANs, warning orders, and FRAGOs.

(3) FSE Plans. The FSE Plans works with the G2 Plans and G3 Plans when a new mission is received or generated. He prepares the field artillery organization for combat, the fire support plan (including draft deep operations mission - done in conjunction with the DOC), target priorities, and fire support coordination measures - including priority of fires. He develops the fire support annex to the corps OPLAN.

b. Intelligence cell. The corps G2 targeting section is a component of the ASPB of the CTOCSE. It is responsible for providing analyzed intelligence to the DOC. Specifically, using the lethal attack guidance to prioritize, G2 targeting analyzes all-source intelligence in order to nominate targets to the FSC. It develops and tracks targets with the corps artillery G2 in support of deep operations. G2 targeting is responsible for locating enemy artillery and air defense assets in support of corps artillery and CTOCSE operations.

c. FSC. The FSC is the heart of deep operations planning and execution for the corps. It uses the corps OPLAN to create up to three deep battle concepts. The FSC develops PIR/IRs for each concept and plans, coordinates, and requests EW support. The corps artillery commander (FSCOORD) has established his headquarters within the FSC and integrates the corps lethal and non-lethal attack assets from there as the corps commander's "deep division commander." He essentially controls the following assets, which have been provided to him by the corps commander.

(1) DOC. The DOC serves as the hub of the FSC. It hosts planning meetings and is the focal point during execution of attack aviation cross-FLOT operations.

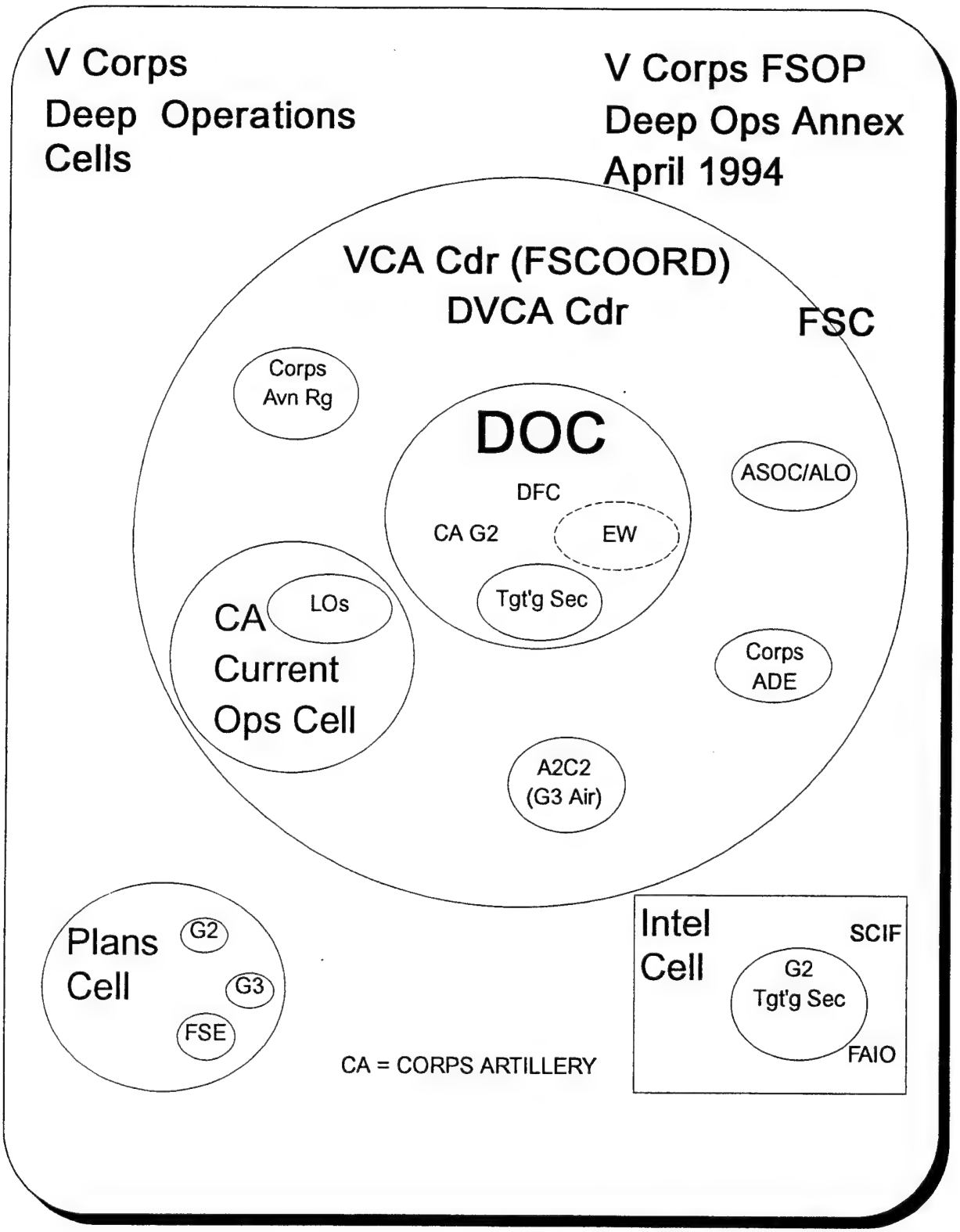

Figure H-1. V Corps deep operations cells

(a) The deep fires coordinator supervises the DOC and is responsible for coordinating and synchronizing all actions and ensuring that the deep operations team is prepared to execute any CONPLANs as required.

(b) The corps artillery G2 establishes the intelligence requirements for the CTOCSE and develops additional named areas of interest (NAI) for deep operations which are incorporated into the corps NAI lists. He tracks the enemy portion of the battle, plans the battle during the day, and executes at night.

(c) The targeting section determines the validity of target nominations in accordance with the corps commander's lethal attack guidance matrix and any verbal deep operations guidance in effect. Targets meeting the corps commander's attack guidance are considered for attack by ATACMS/MLRS, BAI, or nominated to Land Forces Central Europe (LANDCENT) as AI targets.

(d) EW. With the elimination of the EW officer from the corps TO&E, the corps artillery G2 is responsible for coordinating EW support and advising the corps commander on employment of divisional EW assets in support of corps operations. The corps artillery G2 coordinates with the corps G2 for technical data, LANDCENT/Allied Air Forces Central Europe (AIRCENT) for EAC EW support, and corps G6 for restricted frequency listing.

(2) Corps artillery COC. The COC coordinates all deep fire missions and monitors the friendly tactical situation. They coordinate all SEAD missions, develop FSCMs to support deep operations, monitor the position and combat power of friendly artillery units, clear ATACMS missions, and post the status of friendly maneuver brigades. They adjust the artillery task organization, if required, to execute deep operations.

(3) Corps aviation regiment. The regimental command post is collocated with the DOC/FSC; the commander is an integral member of the deep operations team/process. He is responsible for drafting CONPLANs for nightly helicopter cross-FLOT attacks. The CONPLANs are written by the deputy corps aviation officer, reviewed by the corps artillery commander, and then approved by the corps commander. Aviation routes are provided to the targeting team for development of SEAD plans/programs.

(4) A2C2. The corps A2C2 element is responsible for coordination, integration, regulation, and identification of use/users of airspace. The element is located in the FSC and deconflicts the use of airspace by such activities as tactical air support, Army aviation, unmanned aerial vehicles, air defense artillery, field artillery, and EW assets.

(5) ADE. The corps ADE is responsible for limiting the effectiveness of enemy offensive air efforts in order to permit freedom of action of friendly forces. Corps air defense includes all measures designed to nullify or reduce the effectiveness of hostile aircraft or guided missiles after they are airborne. The ADA's contribution to corps' deep attack operations is to preserve deep attack systems (prevent fratricide) and their support systems. The ADE is located in the FSC, provides ground-based ADA coverage over deep attack assets and support systems, and

participates in the process of ensuring the proper weapon control status and the deep operation routes are disseminated down to the fire unit level.

(6) ASOC/ALO. The ALO is responsible for advising the corps commander on all aspects of OAS; evaluating, coordinating, and processing OAS requests originating within its area of responsibility (AOR); and employing OAS missions operating in its AOR. The ASOC is located in the FSC and coordinates air space clearance with the A2C2 element.

H-3. V Corps deep operations execution. Doctrine states that forces must fight the rear, close, and deep battles simultaneously, realizing that they are linked and interdependent. In V Corps, this concept is referred to as the "ONE CORPS FIGHT." The corps artillery commander, as the corps "deep division commander," conducts deep operations to isolate the current, close battle and to create the conditions necessary for the success of close operations. He serves as the chief opera- tor and executor of deep operations, develops and transmits the corps commander's intent and concept of operation to the fire support community, and coordinates and synchronizes the execu- tion of all deep OPLANs and air and fire support for deep operations. He approves the corps deep lethal attack guidance and corps EW target list worksheet prior to their submission to the corps commander and makes CONPLAN "GO/NO GO" decisions in conjunction with the corps G2, aviation regimental commander, and LRSU commander during planning and execution meetings.

H-4. V Corps daily targeting and deep operations. The corps targeting and deep operations planning/execution cycle (figure H-2) covers 72 hours and represents a continuous process of decide, detect, and deliver. V Corps organizes its 24-hour targeting and deep operations planning/execution cycles around the air tasking order (ATO) time periods (0400 today to 0359 - local time - tomorrow). The following sequence of events represents a typical day in corps deep operations targeting, planning, and execution.

- 0200: EAC (LANDCENT/AIRCENT) daily campaign coordination meeting. V Corps ALO receives guidance delineating available sorties for next 24-hour period.

- 0400: BAI (ATO) flying day begins, divided into six, 4-hour blocks.

- 0600: FSC shift change brief.

- 0700: Corps commander's current operations update of last 12 hours of operations.

- 1000 Targeting team meeting/briefing. Addresses future (72 hours) operations, to include PIR, corps deep lethal attack guidance, corps EW target list worksheet, intelligence collection plan, cross-FLOT operations, and availability of ATACMS-capable launchers and missiles for operations.

- 1100: BAI nominations due to corps G3 air (to build corps ASSESSREP).

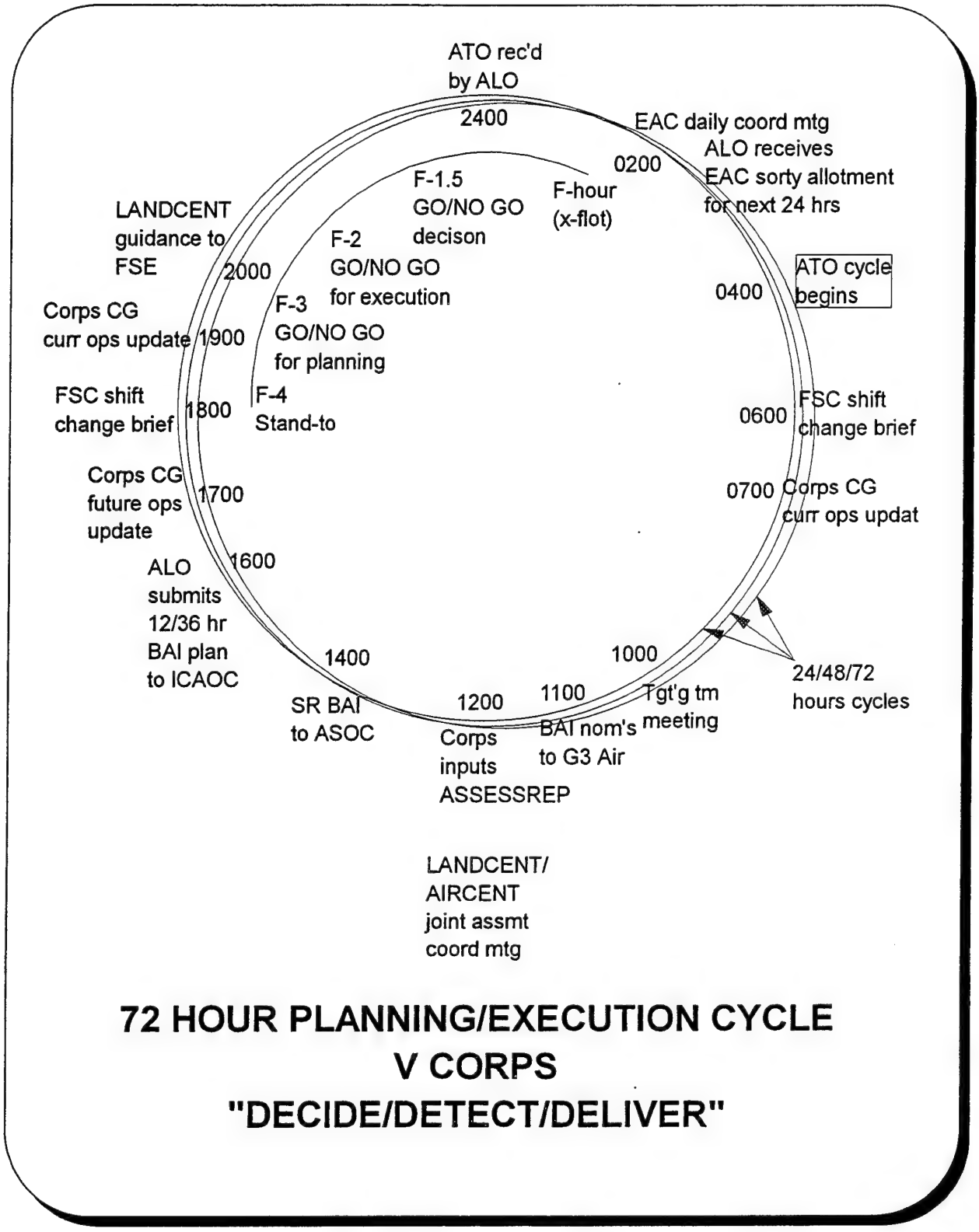

Figure H-2. V Corps ATO cycle, 0400-0359

- 1200: LANDCENT/AIRCENT joint assessment coordination meeting. To assess planned air operations for validity; impacts corps air allocation for upcoming operations.

- 1200: Input for corps ASSESSREP; has impact on BAI and EW support.

- 1400: Targeting officer submits short-range BAI plan to ASOC.

- 1600: ALO submits 12/36 hour BAI plan to ICAOC.

- 1700: COMLANDCENT decision brief. Affects corps G3 plan and impacts on ATO to be used in FSC.

- 1700: Corps commander's future operations update; operations out to 72 hours addressed.

- 1800: FSC shift change brief.

- X-FLOT (F-Hour) minus 4 hours: Stand-To is a formal meeting to initiate a specific deep attack operation planning/execution sequence for a given CONPLAN. The FSCOORD presents his guidance and announces the time sequence.

- X-FLOT minus 3 hours: "GO/NO GO" for planning briefing is used to determine if enough information is available about the enemy to continue planning for a particular deep operation. At the end of the meeting, the FSCOORD makes a "GO/NO GO" decision to continue/discontinue planning.

- X-FLOT minus 2 hours: "GO/NO GO" for execution briefing is used to determine if enemy indications are sufficient to provide a "GO" for execution.

- X-FLOT minus 1.5 hours: C2 passes to aviation (LRSU) commander(s), who makes final decision. If "GO," COC makes final lethal SEAD coordination.

- X-FLOT minus 0.5 hours: Wheels up; lethal and non-lethal SEAD are executed prior to and after F-hour.

- 1900: Corps commander's current operations update of last 12 hours of operations.

- 2000: LANDCENT guidance received by FSE. Reflects results of 1700 COMLANDCENT decision brief.

- 2400: ATO received by ALO; addresses CAS, BAI, and USAF EW availability for next 24-hour period.

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APPENDIX I

TASK/SUBTASK "MICRO" FLOW DIAGRAMS

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APPENDIX I

TASK/SUBTASK "MICRO" FLOW DIAGRAMS

I-1. Introduction. A separate flow diagram (key at figure I-1) was developed for each task/ subtask. These diagrams were developed using information from the corps ARTEP, FMs pertaining to fire support in the 6-20 series, and CGSC Student Text 100-9, *The Tactical Decisionmaking Process*. The diagrams represent the flows of tasks in accordance with doctrinal references.

a. Each diagram contains the task/subtask number and name identification (center box). Information regarding who and during which phase the task is performed is contained in the lower left-hand box. The necessary input(s) with the task number that generated the input (the lack of a task number implies the input was derived from a continuous process or obtained from a source not considered key to the deep operations effort) and the identification of the staff section that developed each input are located to the left of the center box. The output(s) produced by performing the task/subtask, the recipient(s) of the output(s) (the staff section(s) that needs the output as an input to accomplish follow-on tasks), and the task number(s) that will be performed subsequently using the output as input from this task/subtask are located to the right of the center box. Comments are provided in the lower left-hand box. They contain the TASK NUMBER, WHERE (i.e., which of the four cells: plans, fire support, intelligence, or current operations) the task is performed, WHO (i.e., which element within the cell), and WHEN (i.e., which planning or execution phase) the task is performed. The date of the last update of the chart is contained in the lower right-hand corner.

b. The tasks/subtasks have been grouped by WHERE and WHEN they are performed. Within each group, the tasks are placed in numerical order. The groups are contained in tabs; an index is provided on the next page. Figure I-2 shows how the tabs are organized by WHERE and WHEN the tasks/subtasks are performed.

I-2. Task/subtask repetition. `The tasks in tabs A through O are performed during the plan function of deep operations, which begins with the receipt of a new mission from EAC or guidance from the commander, and ends with development of the OPLAN. Tabs P through AD are performed during the execution function of deep operations, which begins with the enactment of an OPLAN as an operations order (OPORD) and ends when the mission is completed or a new OPORD is effective. Numerous tasks are required for both planning and execution; therefore, these are found in both the plan and execution segments of deep operations C2 procedures. They are not necessarily found to precede or succeed with the same inputs or tasks in both segments.

I-3. Distribution. There are more than 230 separate flow diagrams in this appendix. Therefore this appendix is published in a separate binder and is NOT distributed with the main report. If a copy of this appendix is desired, contact D&SA BL (see appendix Q for address).

DEEP OPERATIONS

TASK/SUBTASK

"MICRO" FLOW DIAGRAMS

Table I-1. Deep operations task/subtask "micro" flow diagrams

TAB	CELL	SEGMENT	PHASE
A	INTEL	PLAN/"DECIDE"	MISSION ANALYSIS
B	FSC	PLAN/"DECIDE"	MISSION ANALYSIS
C	CURR OPS	PLAN/"DECIDE"	MISSION ANALYSIS
D	PLANS	PLAN/"DECIDE"	MISSION ANALYSIS
E	INTEL	PLAN/"DECIDE"	ESTIMATE PROCESS
F	FSC	PLAN/"DECIDE"	ESTIMATE PROCESS
G	CURR OPS	PLAN/"DECIDE"	ESTIMATE PROCESS
H	PLANS	PLAN/"DECIDE"	ESTIMATE PROCESS
I	INTEL	PLAN/"DECIDE"	WARGAMING
J	FSC	PLAN/"DECIDE"	WARGAMING
K	CURR OPS	PLAN/"DECIDE"	WARGAMING
L	PLANS	PLAN/"DECIDE"	WARGAMING
M	INTEL	PLAN/"DECIDE"	ANNEXES/OPLAN
Mc	FSC	PLAN/"DECIDE"	ANNEXES/OPLAN
N	CURR OPS	PLAN/"DECIDE"	ANNEXES/OPLAN
O	PLANS	PLAN/"DECIDE"	ANNEXES/OPLAN
P	INTEL	EXECUTE/"D2"	EXECUTE/EVALUATE
Q	FSC	EXECUTE/"D2"	EXECUTE/EVALUATE
R	CURR OPS	EXECUTE/"D2"	EXECUTE/EVALUATE
S	PLANS	EXECUTE/"D2"	EXECUTE/EVALUATE
T	INTEL	EXECUTE/"D2"	CONCEPT PROCESS
U	FSC	EXECUTE/"D2"	CONCEPT PROCESS
V	CURR OPS	EXECUTE/"D2"	CONCEPT PROCESS
W	PLANS	EXECUTE/"D2"	CONCEPT PROCESS
AA	INTEL	EXECUTE/"D2"	PLAN/WARGAMING
AB	FSC	EXECUTE/"D2"	PLAN/WARGAMING
AC	CURR OPS	EXECUTE/"D2"	PLAN/WARGAMING
AD	PLANS	EXECUTE/"D2"	PLAN/WARGAMING

"D2" = "Detect-Deliver"

KEY: Next page

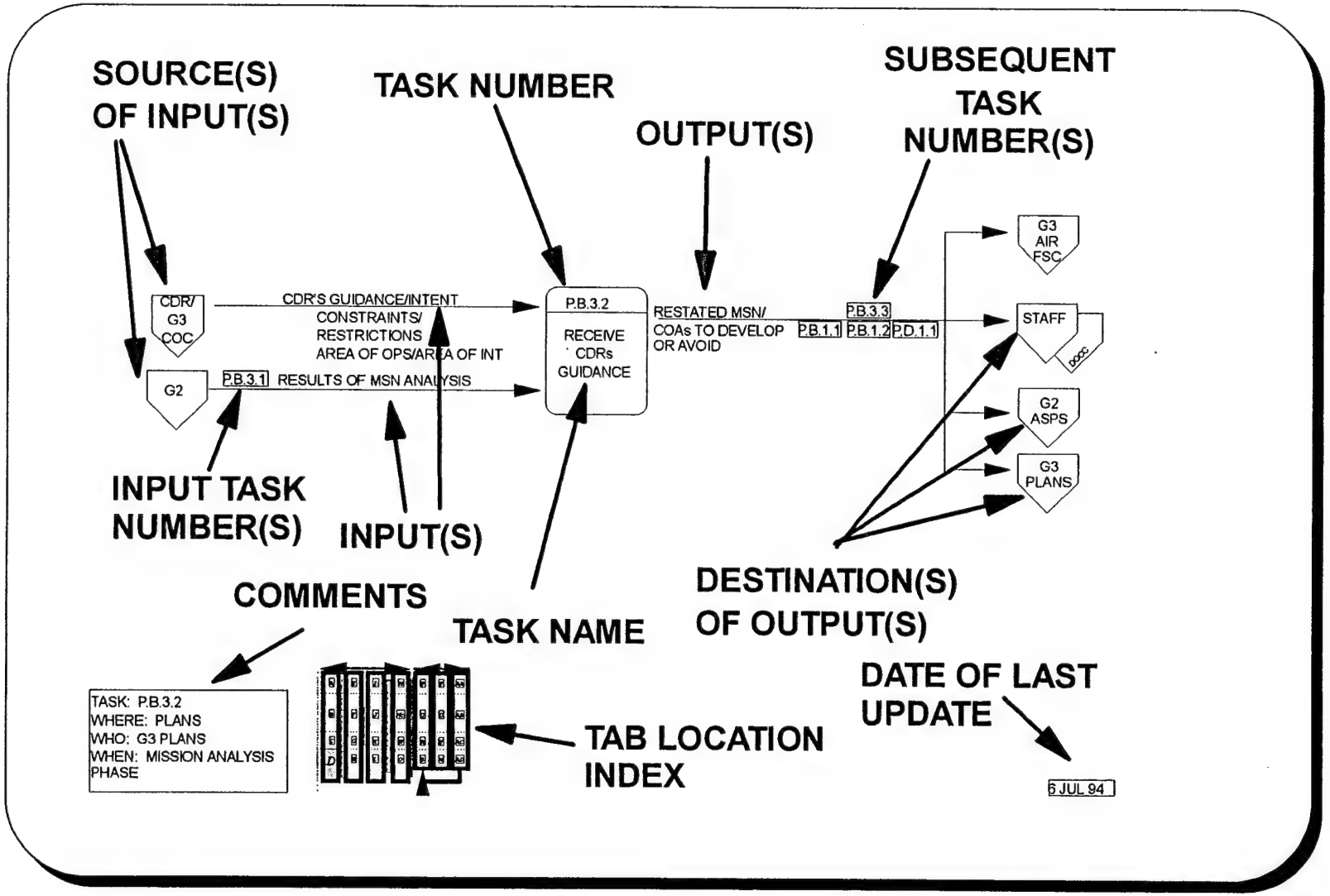

Figure I-1. Key to task/subtask "micro" flow diagram

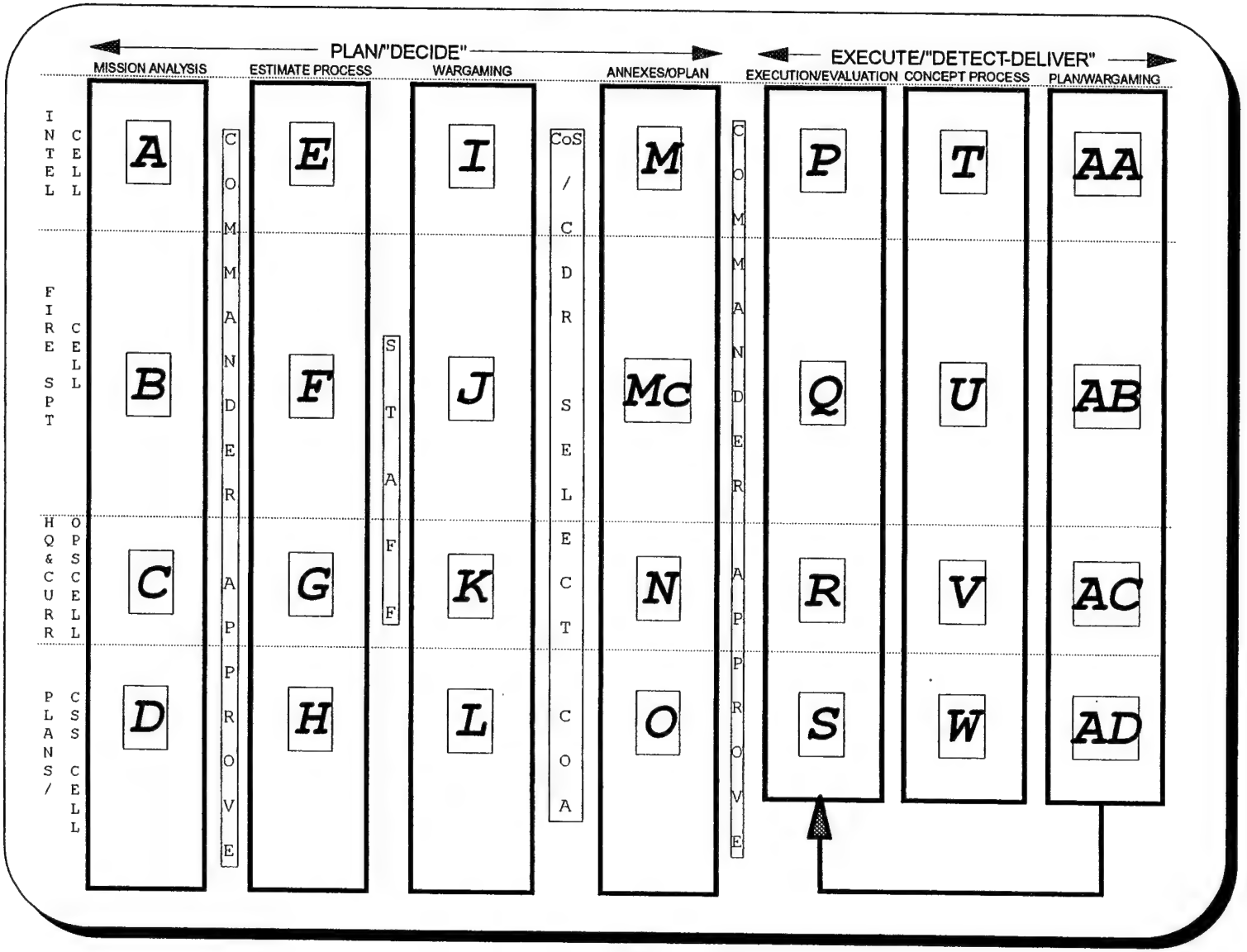

Figure I-2. Tab organization of tasks/subtasks

APPENDIX J

DOCTRINAL FLOW DIAGRAM

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APPENDIX J

DOCTRINAL FLOW DIAGRAM

J-1. Introduction. This network represents the "doctrinal" flow of tasks (from EEA 1) through the corps staff sections (EEA 2) that perform deep operations C2 procedures. The network is organized by the planning and execution functions. Each function is decomposed into phases as found in the tactical decisionmaking process of CGSC Student Text 100-9.

a. Planning function. The planning function is equivalent to the *decide* function of the targeting methodology and may be considered to occur in four distinct DDP phases (paragraph 3-1c(4a)).

(1) Mission analysis. This phase begins with receipt of a new/revised mission from EAC or analysis by the corps commander that a major revision to the current mission is required. Products of this phase are the restated mission, essential tasks, and implied tasks from the plans cell and commander's critical information requirements from the intelligence cell.

(2) Estimate process. This phase begins with receipt of the products from the mission analysis phase. All four staffs develop estimates based on the products and the commander's intent. Products from this phase are the concept of operation and COAs from the plans cell, situational template and high-value target list from the intelligence cell.

(3) Wargaming. This phase uses all previous products and is conducted in the plans cell with input/assistance from all the other cells. Products from this phase are the recommended COA and decision support template from the plans cell; the event template, named are of interest, target area of interest, and collection management plan from the intelligence cell; the target selection standards, attack guidance matrix, and high-priority target list from the fire support cell; and the warning order from the current operations cell.

(4) Annexes/OPLAN. This final planning phase results in the OPLAN/OPORD with supporting annexes.

b. Execution function. The execution function is equivalent to the *detect-deliver* functions of the targeting methodology.

(1) Execution/evaluation. During the execution of an OPORD, the enemy is continually *tracked,* constant evaluation of progress is being made, and battle damage is being *assessed.*

(2) Concept process. Depending on the success (or failure) of the operation, the concept of the operation is *assessed* to determine if the current OPORD is valid, if a sequel should be adopted, or if a new COA should be developed. This phase is a compression of the mission

analysis and estimate process phases of the DDP above, and is the beginning of the CDP (paragraph 3-1c(4b)).

(3) Plan/wargame. If a new COA is developed, a hasty wargame will be conducted to determine its level of potential success. A recommendation is made to the commander and a FRAGO is prepared by the plans cell. This phase is a compression of the wargaming and annexes/OPLAN phases of the DDP, and is the end of the combat decisionmaking process (CDP).

J-2. Planning function. The "macro" doctrinal flow diagram (figure J-1a) on page J-4 shows the four corps cells that perform deep operations C2 procedures on the vertical axis, the four planning phases on the horizontal axis, and contains the task/subtask numbers and names within each group of cell/phase combination. The task/subtask numbers and names identify the tasks/subtasks contained in appendixes B, C, D, and E. Tasks/subtasks beginning with "P" are planning tasks and are found in appendix B. Tasks/subtasks beginning with "C" are coordination tasks and are found in appendix C. Tasks/subtasks beginning with "S" are synchronization tasks and are found in appendix D. Tasks/subtasks beginning with "E" are execution tasks and are found in appendix E.

J-3. Execution function. The "macro" doctrinal flow diagram (figure J-1b) on page J-5 shows the four corps cells that perform deep operations C2 procedures on the vertical axis, the three execution segments on the horizontal axis, and contains the task/subtask numbers and names within each group of cell/phase combination. The task/subtask numbering scheme is the same as the planning function described in paragraph J-2.

J-4. Staff authorizations. The doctrinal staff sizes are listed in the right-hand column on page J-5. These are the TO&E authorizations found in doctrinal publications. For modeling analysis purposed, it was assumed on half of the personnel would be on duty on each shift.

J-5. Comparative analysis with DOCC model. The "macro" doctrinal flow diagram was modified/simplified for the purpose of computer modeling and performing a comparative analysis with the DOCC model. The planning function was reduced to three phases, deleting the annexes/ OPLAN phase. The execution function was melded into a single phase (see figure J-2 on page J-6).

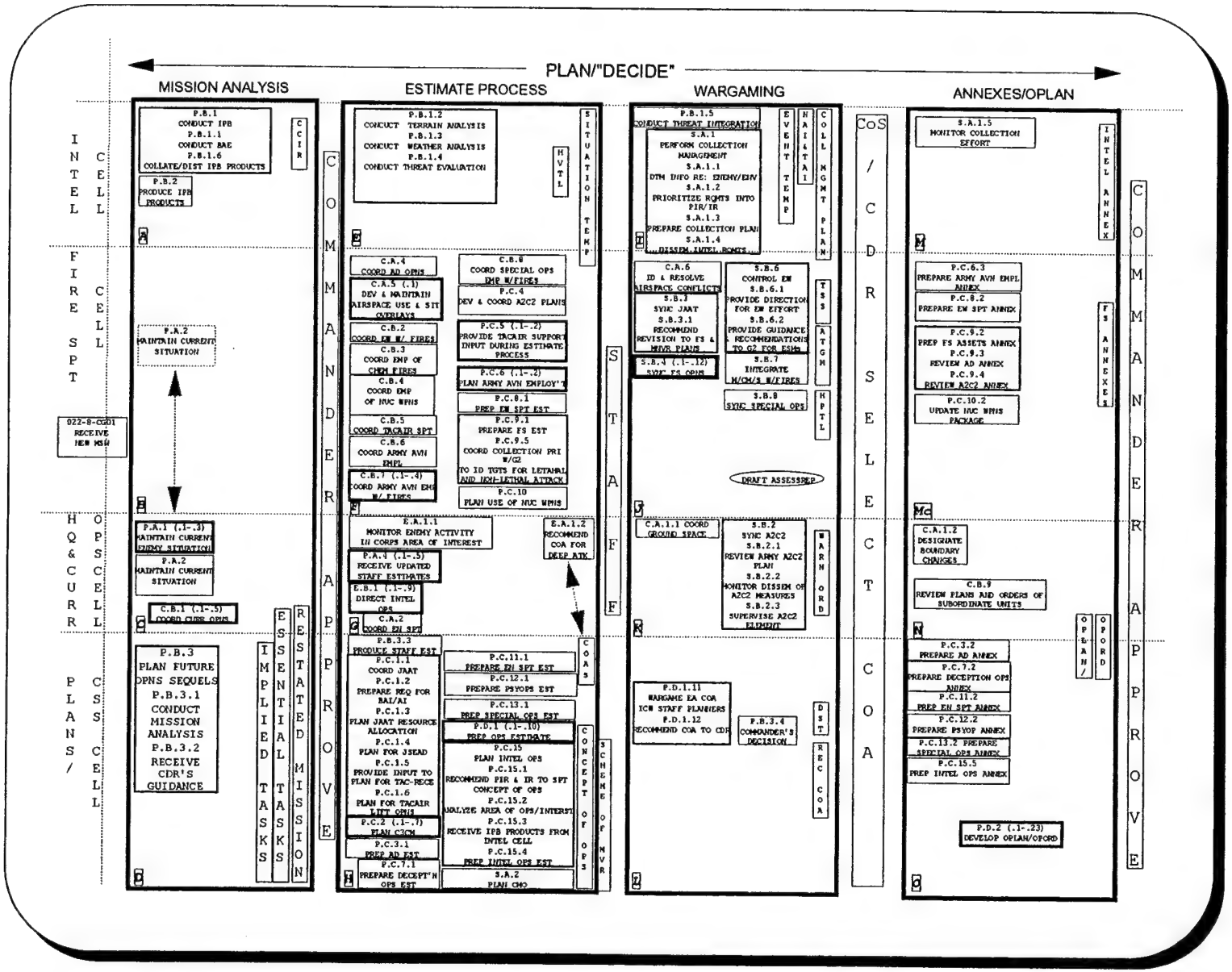

Figure J-1a. Doctrinal macro flow diagram, PLAN/"DECIDE"

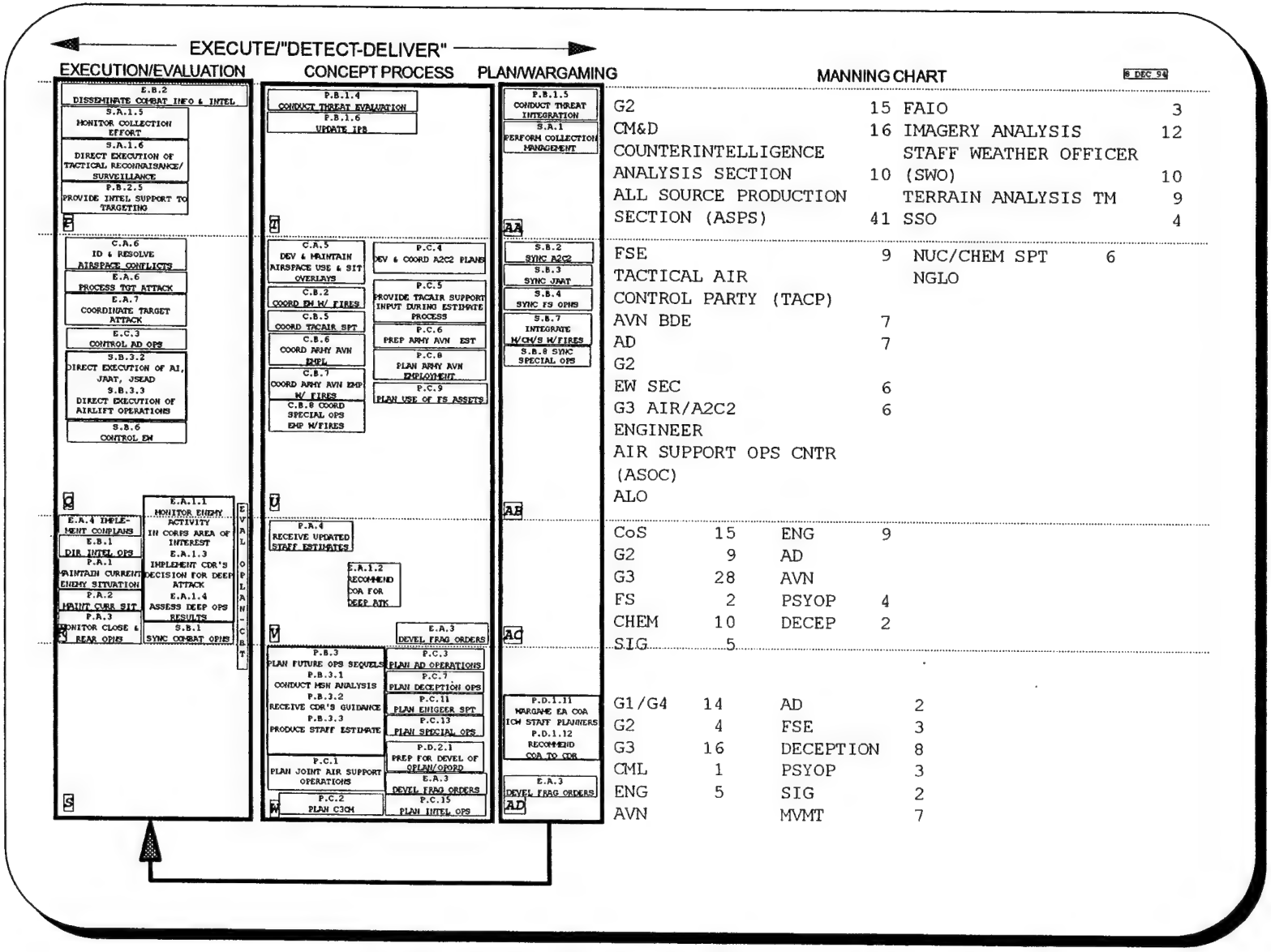

Figure J-1b. Doctrinal macro flow diagram, EXECUTE/"DETECT-DELIVER"

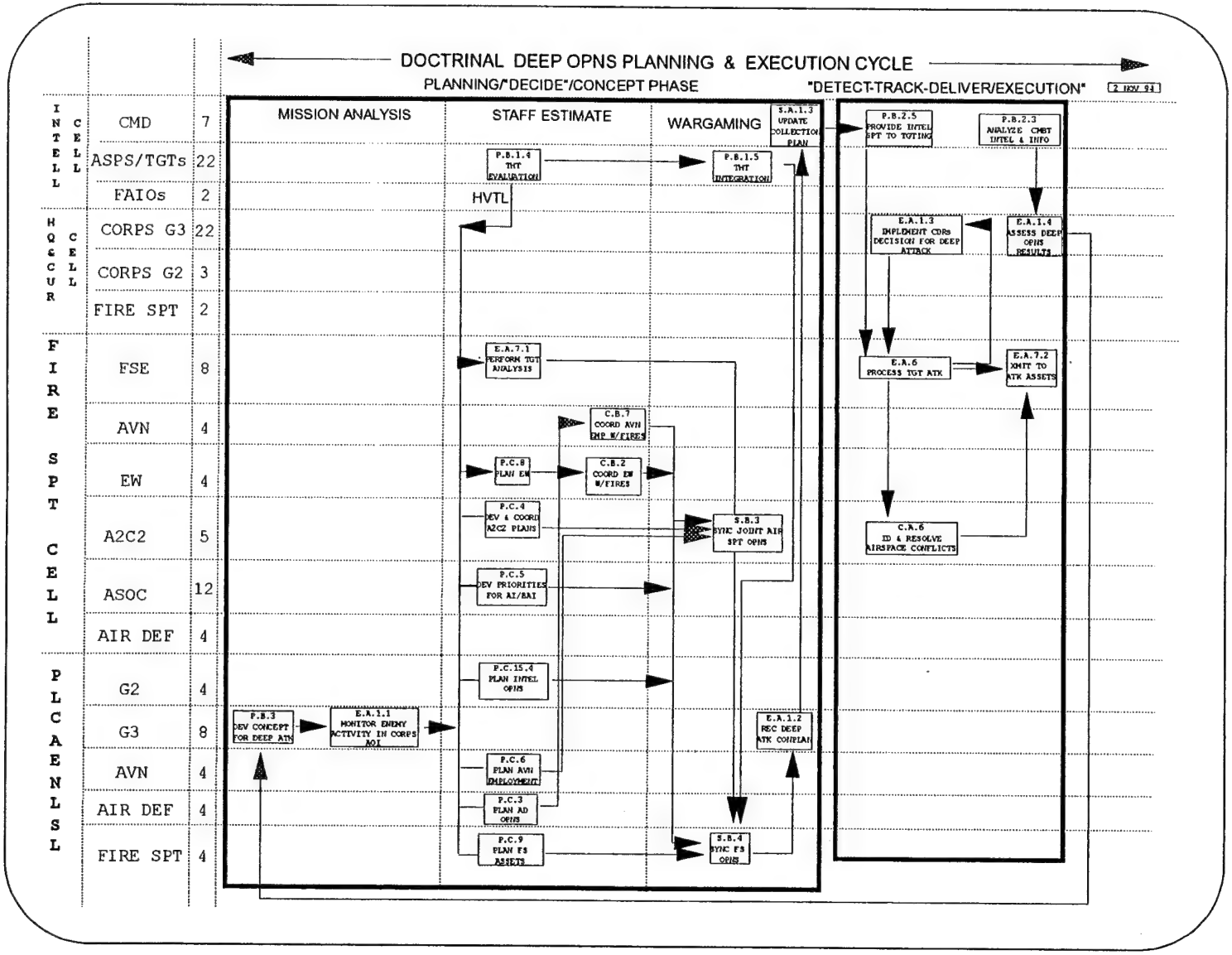

Figure J-2. Doctrinal deep operations planning and execution cycle

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APPENDIX K

DOCC FLOW DIAGRAM

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APPENDIX K

DOCC FLOW DIAGRAM

K-1. Introduction. This network represents the DOCC (V Corps) flow of tasks through the corps staff sections that perform deep operations C2 procedures. This task flow is a condensed version compared to the doctrinal flow diagram in appendix J.

a. Planning function. The corps' 72 and 48 hour planning is conducted similarly to the doctrinal model described in Appendix J, using the deliberate decisionmaking process model from CGSC Student Text 100-9. The primary product for beginning the deep operations planning in the DOC is the corps commander's intent. From this the DOC and FSC begin the deep operations planning cycle. The deep operations planning function is equivalent to the *decide* function of the targeting methodology and may be considered to occur in three distinct DDP phases (paragraph 3-1c(4a)).

(1) Mission analysis. This phase begins with receipt of a new/revised mission from EAC or analysis by the corps commander that a major revision to the current mission is required. Products of this phase are the restated mission, essential tasks, and implied tasks from the plans cell and commander's critical information requirements from the intelligence cell.

(2) Estimate process. This phase begins with receipt of the products from the mission analysis phase. All four staffs develop estimates based on the products and the commander's intent. Products from this phase are the concept of operation and COAs from the plans cell and a situational template and a high-value target list from the intelligence cell.

(3) Wargaming. This phase uses all previous products and is conducted in the plans cell with input/assistance from all the other cells. Products from this phase are the recommended COA and decision support template from the plans cell; the event template, named area of interest, target area of interest, and collection management plan from the intelligence cell; the target selection standards, attack guidance matrix, and high-priority target list from the fire support cell; and the warning order from the current operations cell.

(4) An "annexes/OPLAN" phase is NOT included in this the V Corps flow diagram as they do not publish a formal/written deep operation plan or annex to the OPLAN. Time permitting, they publish (aviation) CONPLANs in bullet chart forms.

b. Execution function. The execution function is equivalent to the *detect-deliver* functions of the targeting methodology. During the execution of a CONPLAN, the enemy is continually *tracked,* constant evaluation of progress is being made, and battle damage is being *assessed.* The results of the Apache helicopter attacks are *assessed* to determine the degree of success. A decision is made to determine if a restrike should be made by other helicopter battalions or if a recycle of the same Apaches should be planned for the same or following night. If a new

CONPLAN is developed, a hasty wargame will be conducted to determine its level of potential success. A recommendation is made to the commander and a FRAGO is prepared by the DOC.

K-2. Planning and execution functions. The "macro" doctrinal flow diagram (figure K-1) on page K-4 shows the three V Corps cells that perform deep operations C2 procedures on the vertical axis, the planning and execution phases on the horizontal axis, and contains the task/subtask numbers and names within each group of cell/function combination. The task/subtask numbers and names identify the tasks/subtasks contained in appendixes B, C, D, and E. Tasks/subtasks beginning with "P" are planning tasks and are found in appendix B. Tasks/subtasks beginning with "C" are coordination tasks and are found in appendix C. Tasks/subtasks beginning with "S" are synchronization tasks and are found in appendix D. Tasks/subtasks beginning with "E" are execution tasks and are found in appendix E.

K-3. Staff authorizations. The V Corps staff sizes are listed in the column between the element names of the staff cells and the planning block column. These are the quantities used by V Corps during exercises and are generally based on one half of the quantities found on their modified table of organization and equipment (MTOE) (half of authorized are on duty each 12-hour shift).

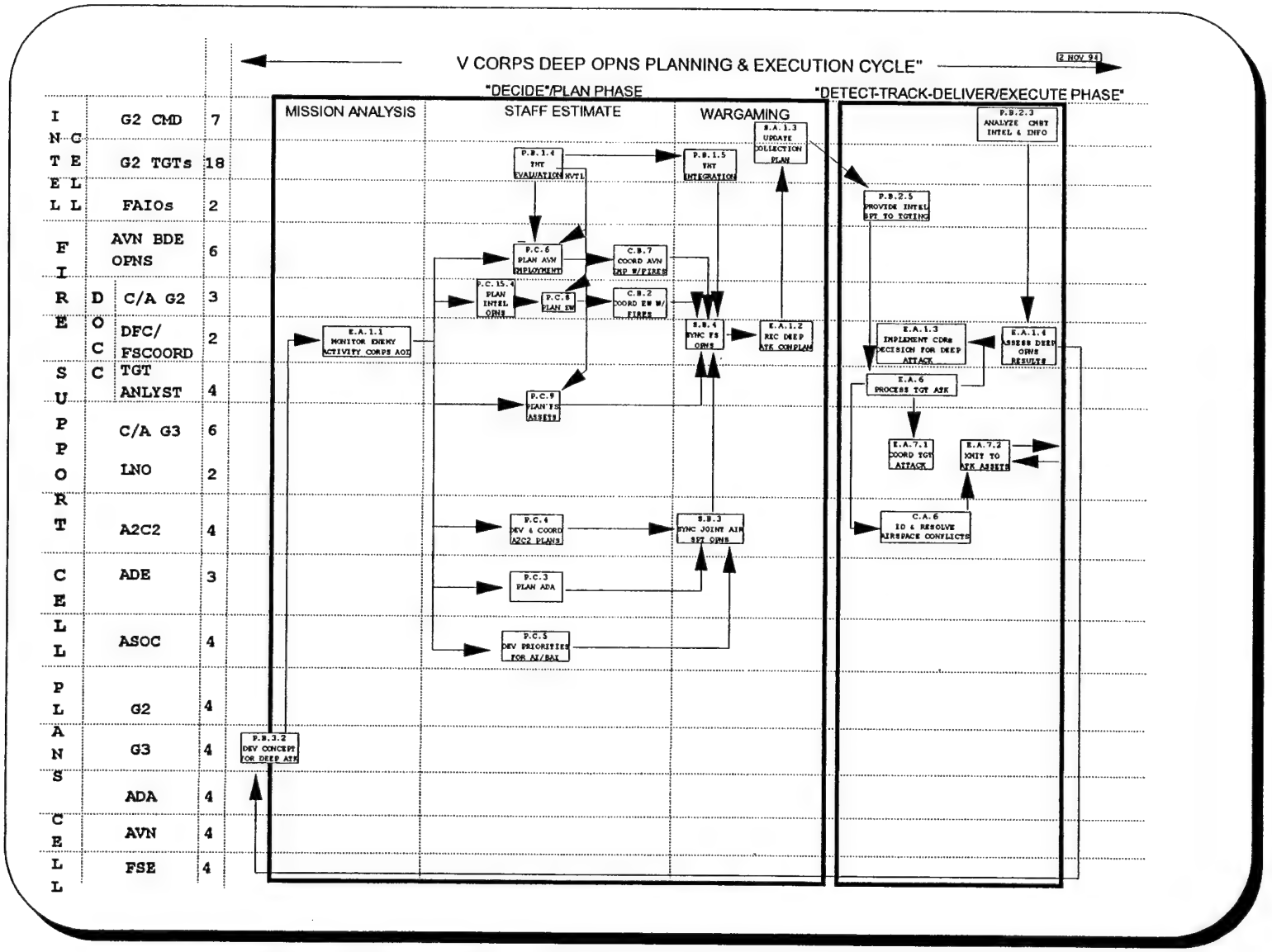

Figure K-1. DOCC (V Corps) deep operations planning and execution cycle

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APPENDIX L

AUTOMATED DEEP OPERATIONS COORDINATION SYSTEM (ADOCS)

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APPENDIX L

AUTOMATED DEEP OPERATIONS COORDINATION SYSTEM (ADOCS)

L-1. Introduction. A late 1980s V Corps evaluation showed that crucial man hours for planning and coordinating deep operations were often lost in major time delays that were a product of bureaucratic auditing processes, excessive amounts of paperwork, and a general confusion among the segregated members of the fire support cell.

a. ADOCS has been adopted as the horizontal processor for planning and executing deep targets to overcome the corps' inefficient manual system. ADOCS supports collaborative target development, nomination, and management as well as providing an integrated tool set for information visualization, planning, and analysis. Workstations may be established on a local area network (LAN) configured as either *basic* or *graphics*. Basic workstations provide access to target databases which allow users to nominate targets and to perform various aspects of target management. Graphics workstations allow users to display digital maps and to overlay symbols upon them. When digital terrain data are available, ADOCS can be used to display profiles, terrain masking, line of sight, slope and elevation, and three-dimensional perspectives.

(1) ADOCS has seven terminals positioned in key FSC sections. These are the attack aviation regiment, field artillery division artillery/brigade LNOs, A2C2, DOC targeting (two each), corps artillery current operations cell, and corps G2 targeting (CTOCSE). Another terminal will be added soon for the ALO.

(2) Each station consists of a 486 personal computer (PC) with a second monitor (the primary monitor for menus to develop targets and fire plans/data processing, the other to display maps and overlays). The work stations are connected via the corps headquarter's LAN (figure L-1). The LAN also digitally connects WARRIOR (collateral order of battle and electronic intelligence (ELINT) databases from CTOCSE) and TACFIRE. This allows target officers to access enemy locations (direct from WARRIOR), develop targets and fire plans (using ADOCS software), and send ATACMS fire missions to launchers (via TACFIRE) all from one terminal.

b. ADOCS has been jointly developed by V Corps and ARPA over the last four years. The ARPA contractor initially programmed software based on manual procedures used in V Corps' DOC. After an initial version was completed, the contractor has been on site during all corps exercises, takes requests for enhancements to the system, and, in a matter of minutes, programs the software to add the desired new capabilities. This has allowed V Corps to develop a near-prototype ATCCS in a matter of a few years. MCS and multiple subscriber equipment (MSE) are scheduled to be included on the LAN soon.

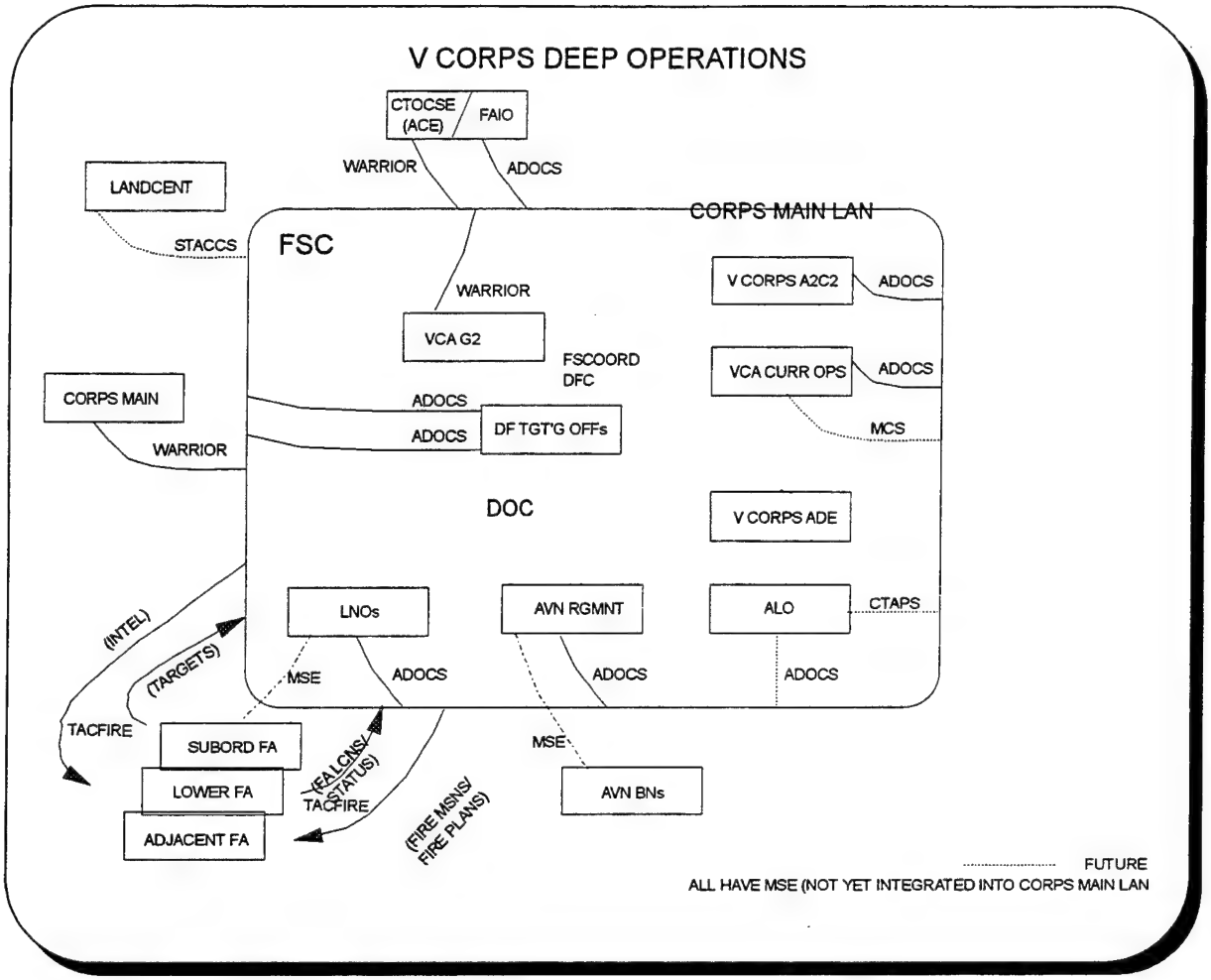

Figure L-1. V Corps local area network

L-2. Results. Within ADOCS, each subscriber has the ability to perform the following tasks.

a. Display Defense Mapping Agency maps input from a laser disc. Scales range from 1:25,000 to 1:1,000,000.

b. Draw boundaries, phase lines, engagement areas, air corridors, and a variety of other graphic control/coordination symbols on the graphics display monitor. This information is simultaneously shared with any other ADOCS workstation in the system.

c. Produce a variety of overlays (i.e., maneuver graphics, target overlay, flight routes) and then display those overlays in conjunction with any others that have been produced on the system.

d. Receive targeting information electronically from the corps G2 targeting section (CTOCSE) and selectively display it graphically on the display monitor.

e. Process pre-planned and immediate targets for ATACMS/MLRS fires, and coordinate airspace clearance with the corps A2C2 element for such fires.

f. Associate targets with a plan name and request ATACMS/MLRS fires and airspace clearance for plans in support of corps operations.

L-3. Conclusions.

a. ADOCS links the various elements within the FSC into an integrated C2 network. All subscribers can share operational information in ADOCS, tailor the information to their needs through the application of various filters, and add or exchange information at any time.

b. ADOCS ended the days when the halls of the FSC were continuously crowded with runners passing notes and shouting for immediate fires. ADOCS supports the fire support mission to provide accurate and timely fires by giving the fire support community an automated system designed to expedite target processing among the members of the deep operations team.

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APPENDIX M

C2NET MODEL SUMMARY

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APPENDIX M

C2NET MODEL SUMMARY

M-1. Introduction. An existing C2 performance computer model (software program) was used for the DOCC performance analysis (chapter 4). The model had been used previously for numerous TRAC studies. Modeler is an interactive, graphical software tool which supports the analysis and design of systems by allowing an analyst to build a model of a system and then simulate the operations of that system. Such systems can be traffic, health-care delivery, or C2. Modeler, which uses stochastic, timed, attributed Petri nets (staPn) methodology, was originally designed to support the analysis of complex C2 systems. Modeler is a graphics and forms-based modeling and simulation tool. The analyst uses a drawing interface to build a network picture of the system being analyzed. A set of forms is used to describe the objects and the behavior of the system. These forms record the attributes and values of the objects (staff/operators, messages, machines) that populate the system, as well as the details of the operations of the system. Modeler simulates the operations of the system ("runs" the model) and provides statistical results describing the behavior of the model. C2NET was built to satisfy the need for a C2 functional area model.

a. C2NET, a specific Modeler model, was developed as a low-resolution model to represent C2 at corps, division, and maneuver brigade headquarters across three of the five battlefield functional areas, maneuver, FS, and intelligence/IEW. ADA and combat service support (CSS) have subsequently been added. The organizations, functions, and tasks performed in the model are representative of AirLand Operations nonlinear battle in the year 2005.

b. The C2NET model input data base (appendix N) consists of six major elements.

- C2 operational facilities (OPFAC)
- Performance tasks
- Task intervals
- Task duration
- Authorized personnel
- Typical personnel requirements

c. The C2 OPFACs are those facilities at corps, division, and maneuver brigade headquarters where the critical C2 tasks are performed. The performance tasks are those critical tasks that support the C2 functions/tasks in each OPFAC. Task intervals are the minimum, mode (most likely), and maximum intervals between occurrences of a task within that OPFAC and are expressed in the data base in minutes. Task duration are expressed by a triangular distribution that represents the minimum, mode, and maximum times to complete a task and is expressed in the data base in minutes. Task completion is the processing time from task receipt (or receipt of information that generates task initiation) to the time a report/guidance/order has been completed and dispatched to the next processing facility in the information network. The authorized personnel are the shift workers in each facility who participate in the performance of C2 tasks.

Personnel authorizations do not include dedicated drivers and generator operators. Personnel requirements are the numbers of personnel typically used to perform each task at each OPFAC.

d. The tasks explicitly modeled represent the processing of target nominations from sensor through target attack, the processing of intelligence (spot) reports, processing requests for support, processing critical situation reports, and the development and processing of FRAGOs for maneuver units. The model was designed to measure processing times for each of these functions. Figure M-1 illustrates both the architecture of the model and the vertical and horizontal flow of information for processing targets from corps-managed sensors.

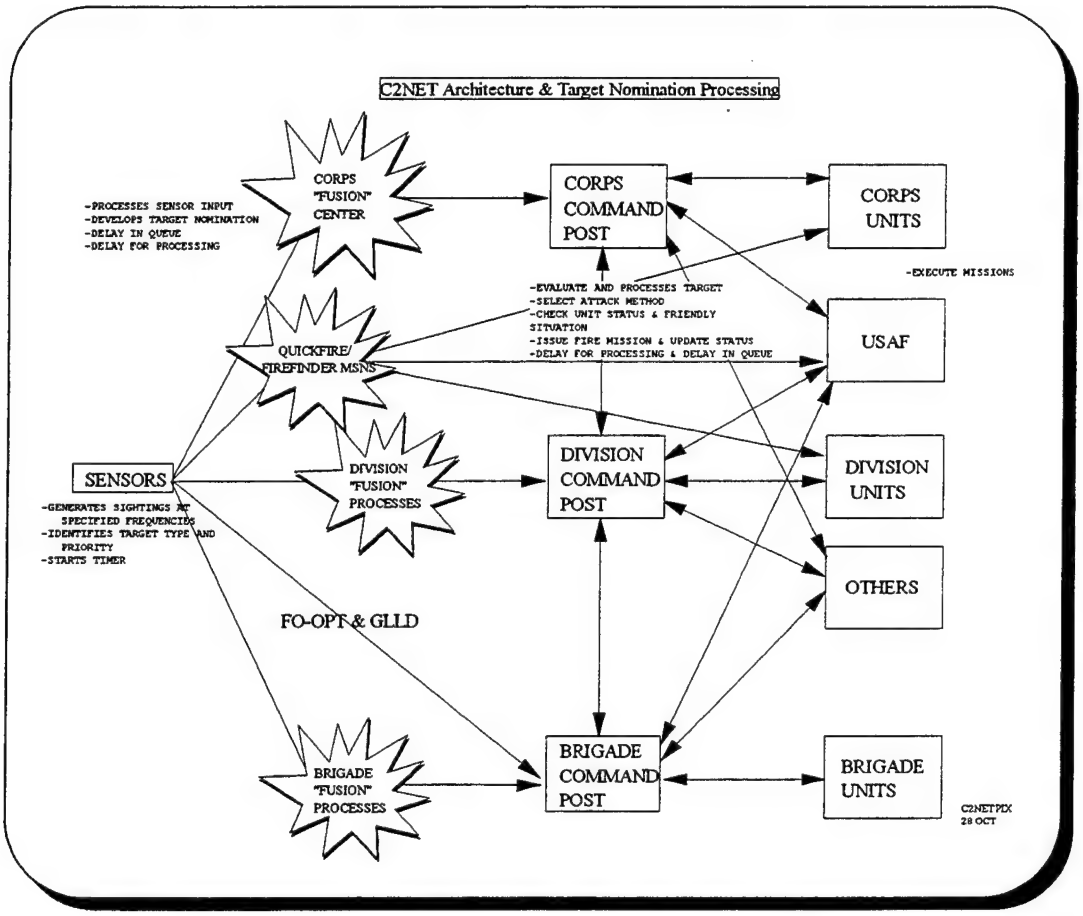

Figure M-1. C2NET architecture

e. This study used only the corps main CP and focused on those cells that perform tasks critical to the planning and execution of deep operations (figure M-2), primarily the corps fire support and plans cells. Each staff section modeled within the corps CP is treated as a separate entity. Each entity (staff section) must perform a given set of tasks in accordance with specific inputs to the entity, and produce specific outputs. The model replicates the performance of tasks inherent to the C2 processes being studied. As a message passes throughout the system, a time delay is applied to it at each staff section. The time delay represents the time required for the personnel in the staff section to perform the appropriate task. The cumulative time taken to

perform tasks/subtasks along a particular path equates to the time required to perform a function (i.e., process a target nomination).

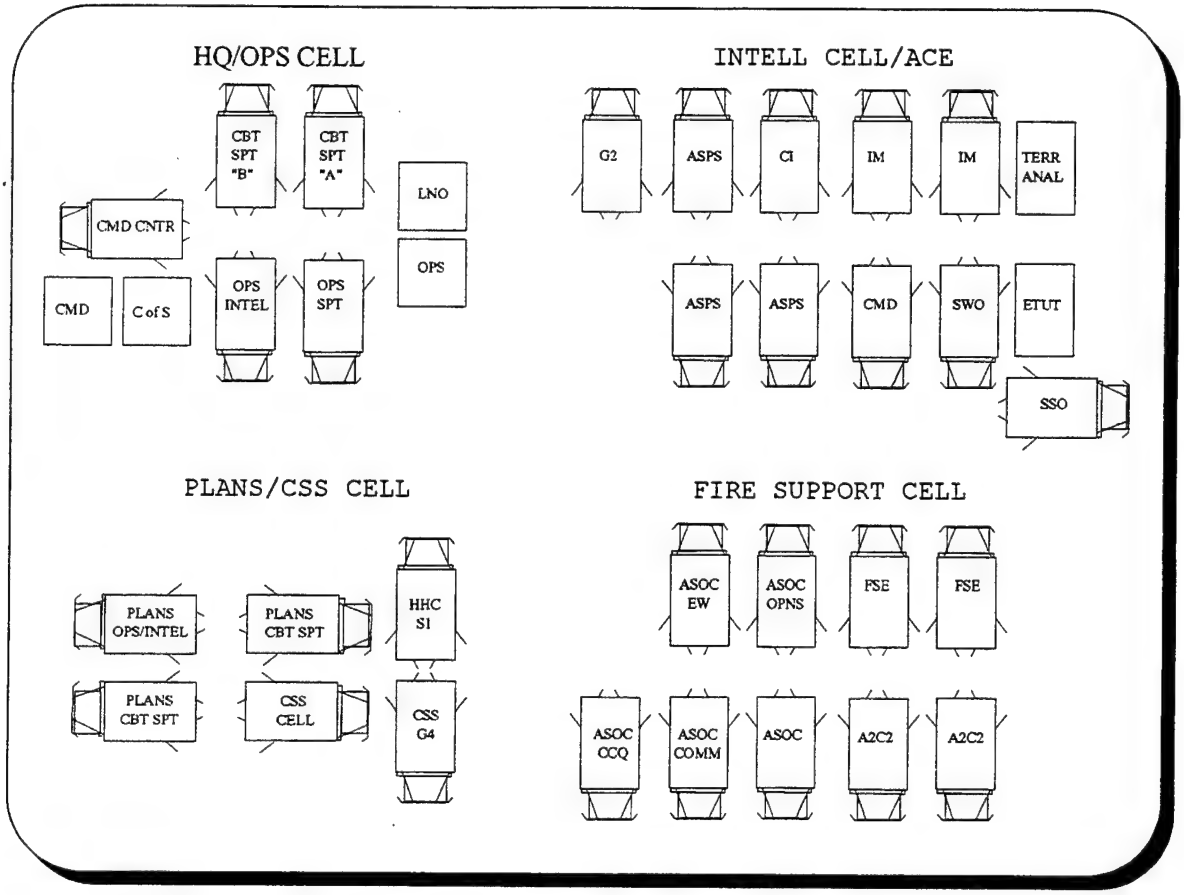

Figure M-2. Corps main command post

f. The key tasks represented in the doctrinal model are listed in table M-1. A key task is one that is essential to successful planning and execution of deep attack operations. Key tasks can be either interactive or generated. An interactive task either receives or passes data between CP cells. Interactive tasks can be driven by either the data from another cell or by a generator. Generated tasks pass information to other CP cells, but they do not receive data as input, they are only driven by a generator. The key tasks are described and expressed in the functional analysis/laydown (chapter 3) for EEAs 1 through 4.

M-2. Doctrinal alternative.

a. The resolution for both the doctrinal and DOCC alternatives is the individual staff section as shown in tables M-1 and M-2, respectively. The design of the C2 organizations required to perform the functions of intelligence, FS, and maneuver at corps was based on the literature search conducted for EEAs 1 through 4 (chapter 3). The resulting doctrinal alternative of deep operations functions is represented in figure M-3.

Table M-1. Doctrinal key tasks list

Staff Section	Size Of Staff Pool/ Req. # Of Personnel	Key Tasks Performed
CORPS G2 TGTs - INTEL CELL	22/3	P.B.1.4 Threat Evaluation
"	22/3	P.B.1.5 Threat Integration
"	22/3	S.A.1.3 Update Collection Plan
FAIOs - INTEL CELL	2/1	P.B.2.5 Provide Intel Spt to Tgting
CORPS G2 - INTEL CELL	7/2	P.B.2.3 Analyze CMBT Intel & Info
CORPS G3 - OPS CELL	18/2	E.A.1.3 Implement CDR's decision for Deep Attack
"	18/2	E.A.1.4 Assess Deep Ops Results
TGT ANALYSTS - FSE	8/2	E.A.6 Process TGT Atk
EW SEC - FSC	4/2	P.C.8 Plan EW
"	4/2	C.B.2 Coord EW w/Fires
AVN BDE	4/2	C.B.7 Coord AVN EMP w/Fires
G3 AIR/A2C2	5/2	P.C.4 Dev & Coord A2C2 Plans
"	5/2	S.B.3 Sync Joint Air Spt Ops
"	5/2	C.A.6 ID & Resolve Airspace Conflicts
ASOC	4/1	P.C.5 Dev Priorities for AI/BAI
G2 PLANS	4/2	P.C.15.4 Plan Intel Ops
G3 PLANS	8/4	E.A.1.1 Monitor Enemy Activity in Corps AOI IAW G2
"	8/4	E.A.1.4 Recommend Deep Attack Plan
AVN PLANS	2/2	P.C.6 Plan AVN Employment
ADA PLANS	2/1	S.B.4 Sync FS Ops
FS PLANS	2/1	P.C.9 Plan FS Assets
"	2/1	S.B.4 Sync FS Ops

b. This alternative was developed from a copy of C2NET. It was modified to more explicitly represent (doctrinal) deep operations C2 procedures. The significant modifications were:

(1) It changed the flow of tasks so that *development of essential and implied tasks* by the G3 is in parallel with *updating intelligence preparation of the battlefield (IPB)* and *developing terrain/weather analysis* by the G2. Previously, all three were conducted in series.

(2) It made *development of priority of fires* and *development of engineer priorities* inputs to *selecting a force course of action*. Previously, these tasks preceded no other tasks; they only provided a load on the staff pool.

(3) It created an ADE staff pool (of three personnel) in the FSC to reflect current doctrine in accordance with FM 100-15-1. When C2NET was first developed, it only represented maneuver, FS, and IEW. When air defense and CSS were added later, an ADE was not added to the FSC.

(4) It removed *plan nuclear weapons (fires)* from field artillery section within the FSE.

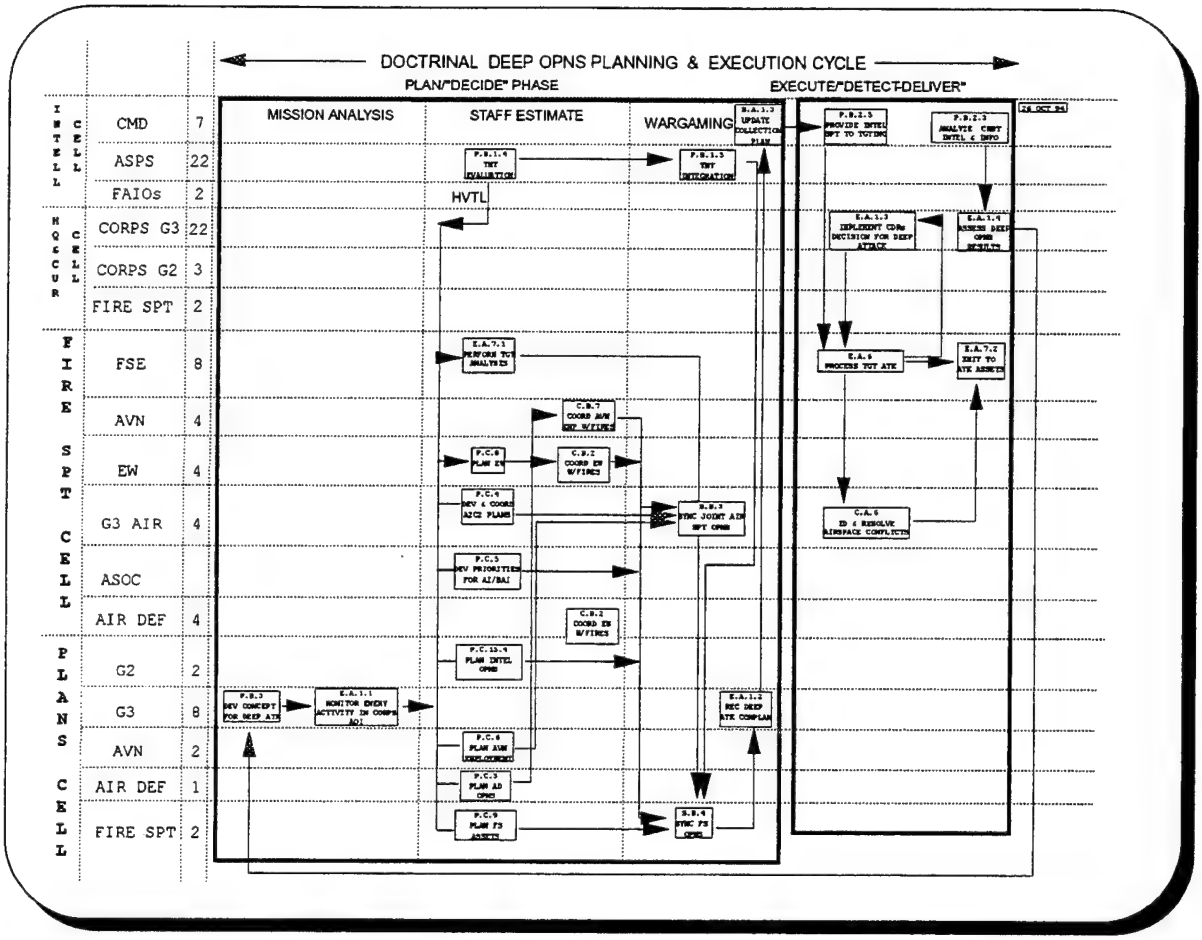

Figure M-3. Doctrinal task flow

(5) It added *identify and resolve airspace conflicts* to the execution process. Previously, this task was in C2NET and only provided a load on the staff pool, but was not integrated into the process.

(6) It reduced the G3 plans staff pool from 24 to 8 personnel.

(7) It moved *develop concept of deep operations* and *develop attack criteria* from the commander to the G3 plans and FSE, respectively. These tasks would be performed by the staff and approved by the commander in accordance with FM 100-15-1.

(8) It corrected time data for *process target attack.* The data had been incorrectly entered.

(9) It altered generation of targets to match the following normal distribution: mean = 8.32, standard deviation = 18.05 with minimum = 0 and maximum = 500.

(10) It reduced the time to plan deep operations from 398.3/531.7/800 to 180/240/300.

(11) It made *plan_deep_operations* part of the OPLAN process.

(12) It changed the G3 air staff size from three to four and removed the following tasks.

(a) *Plan JAAT operations.*

(b) *Update status of joint_aviation_ support.*

(c) *Update_status_of_JAAT_operations.*

M-3. DOCC alternative. A variation of the doctrinal alternative was used to represent the deep operations planning and execution procedures within the DOCC headquarters. The differences between the two were determined by the literature search conducted (to include the V Corps Field SOP, *Deep Operations Annex*, April 1994) and direct observation of V Corps FSC operations. The primary difference is their organization of the FSE creates a corps DOC. This cell has the responsibility to plan deep operations contingencies, coordinate and synchronize the efforts of the deep operations team in developing CONPLANs, and directly supervise the execution of approved CONPLANs. The key tasks used to plan and execute deep operations within the DOCC alternative are listed in table M-2.

Table M-2. DOCC key task list

Staff Section	Size of Staff pool/ Req # of personnel	Key tasks Performed
G2 TGT CELL	18/1	P.B.1.4 Threat Evaluation
"	18/1	P.B.1.5 Threat Integration
"	18/1	S.A.1.3 Update Collection Plan
FAIOs - INTEL CELL	2/1	P.B.2.5 Provide Intel Spt to Tgting
"	2/1	P.B.2.3 Analyze CMBT Intel & Info
AVN BDE - DEEP CELL	6/2	P.C.6 Plan AVN Employment
"	6/1	C.B.7 Coord AVN EMP w/Fires
C/A G2	3/1	P.C.15.4 Plan Intel Ops
	3/1	P.C.8 Plan EW
"	3/1	C.B.2 Coord EW w/Fires
DFC/FSCOORD	1/1	E.A.1.1 Monitor Enemy Activity in Corps AOI
"	1/1	S.B.4 Sync FS Ops
"	1/1	E.A.1.2 Develop/Recommend CONPLAN for DEEP ATK
"	1/1	E.A.1.3 Implement CDRs decision for Deep Attack
"	1/1	E.A.1.4 Assess Deep Ops Results
TGT ANALYSTS - DEEP CELL	4/1	P.C.9 Plan FS Assets
"	4/2	E.A.6 Process TGT Atk
C/A G3	8/1	E.A.7.1 Coord TGT Attack
"	8/1	E.A.7.2 Xmit Tgt to attack Assets
A2C2	4/1	P.C.4 Dev & Coord A2C2 Plans
"	4/1	S.B.3 Sync Joint Air Spt Ops
"	4/1	C.A.6 ID & Resolve Airspace Conflicts
ADA SEC	3/1	P.C.3 Plan AD OPS
ASOC	4/2	P.C.5 Dev Priorities for AI/BAI

a. The resolution of the DOCC alternative is also at the individual staff section level. The primary differences involve the movement of key tasks out of the plans cell and into the FSC and DOC. The DOCC alternative is represented in figure M-4.

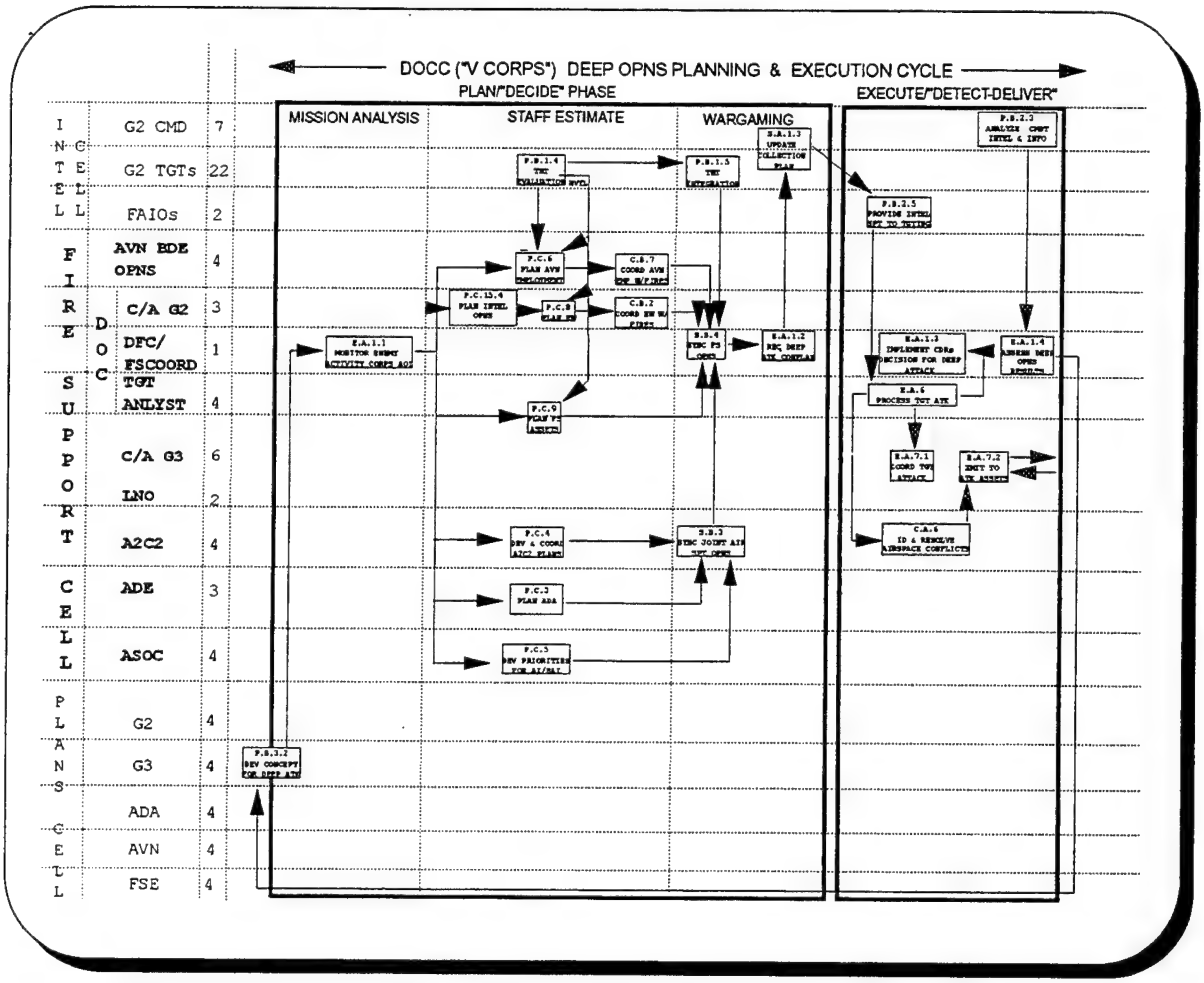

Figure M-4. DOCC task flow

b. This alternative was also developed from the original C2NET model. It was modified to represent DOCC deep operations C2 procedures. The significant modifications were:

(1) It merged G3 Air staff pool into A2C2 element staff pool under the FSC.

(2) It added the aviation brigade staff pool to FSC.

(3) It split the field artillery staff pool into DOC and corps artillery G3.

(4) It routed the *concept/plans/wargaming* process through each of the FSC staff pools.

(5) It adjusted the following staff pool sizes as follows: aviation - 6, DOC - 8, corps artillery G3 - 6, A2C2 element - 4, ADE - 3, and ASOC - 4.

(6) It moved the following tasks from the A2C2 element to:

(a) *Coordinate with aviation for employment of aviation-close* and *Plan Army aviation* to aviation brigade.

(b) *Coordinate ADA operations within area and regional ADA commands; coordinate reallocation of ADA assets; coordinate changes in ADA priorities; monitor and disseminate ADA rules and procedures; monitor impact of EW on ADA operations; monitor status of ADA units; integrate ADA in corps area; prepare ADA situation report (SITREP);* and *update TAC and rear ADA sections on current ADA status* to ADE.

(c) *Coordinate ADA unit movement and positioning; disseminate airspace control order; disseminate airspace tasking order; update status of joint air attack team (JAAT) operations; update status of air support assets; coordinate aviation support for close battle;* and *update status of air mission results* were deleted as they were duplicated under *concept/plans/ wargaming,* paragraph M-3b(4).

(7) It moved *processing of targets not on the high priority target list* from the G2 and G3 to the DOC.

(8) It added two parallel tasks after processing targets within DOC and prior to transmitting: *coordinate target attack* by the corps artillery G3 and *identify and resolve airspace conflicts* by the A2C2.

(9) It adjusted processing times for the following tasks, using distribution functions developed from data collected during the July 1994 V Corps CARAVAN GUARD CPX (appendix M).

(a) *Process target attack* (DOC): Exponential distribution with mean = 6.25 minutes.

(b) *Coordinate target attack* (Corps artillery G3): Gamma distribution with Alpha = 2.47 and Lambda = 2.98 minutes.

(c) *Identify and resolve airspace conflicts* (A2C2): Exponential distribution with mean = 17.22 minutes.

(d) *Transmit mission to unit* (DOC): Exponential distribution with mean = 2.26 minutes.

(10) It altered generation of targets to match the following normal distribution: mean = 8.32, standard deviation = 18.05 with minimum = 0 and maximum = 500.

(11) It added additional logic to determine when a message or target nomination goes stale.

APPENDIX N

DATA

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APPENDIX N

DATA

N-1. Data. The original C2NET data base represented maneuver control, fire support, and IEW. The input data was collected from TRADOC schools and the U.S. Combined Arms Center-Combat Developments (CAC-CD) by the Command and Control Analysis-to-TRAC Element. The data was consolidated, reviewed by subject-matter experts from CGSC, and developed into the "original" C2NET data base. The intended use of the C2NET data base is to provide the operational parameters for measuring queuing and processing delays within the C2NET model.

a. The C2NET model input data base consists of six major elements:

- C2 operational facilities (OPFACs)
- Performance tasks
- Task intervals
- Task durations
- Authorized personnel
- Typical personnel requirements

(1) The C2 OPFACs are those facilities at corps, division, and maneuver brigade headquarters where the critical C2 tasks are performed. The total number of OPFACs at corps is 40 with 200 OPFAC/task combinations. The total number of OPFACs at division is 26 with 162 OPFAC/task combinations. The total number of OPFACs at maneuver brigade is 13 with 96 OPFAC/task combinations.

(2) The performance tasks are those critical tasks that support the C2 functions/tasks in each OPFAC.

(3) Task intervals are the frequency with which a modeled task occurs. An interval is expressed as the minimum, mode (most likely), and maximum time between occurrences of a task within an OPFAC and is expressed in the data base in minutes.

(4) Task durations is the amount of time to perform a modeled task. Duration is expressed as the minimum, mode, and maximum amounts of time to complete a task and are expressed in the data base in minutes. Task completion is the processing time from task receipt, or receipt of information that generates task initiation, to the time a report/guidance/order has been completed and dispatched to the next processing facility in the information network. [NOTE: These triangular distributions represent the lower, most common, and upper bound for receiving and processing information.]

(5) The authorized personnel is the number of personnel who are authorized in an OPFAC during a single shift. This number excludes those personnel who are listed as dedicated vehicle

rivers and generator operators. This information was derived from the approved organizational structure for the Command and Control Responsiveness Study.

(6) Personnel requirements are the numbers of personnel typically used to perform a modeled task in each OPFAC/task combination.

b. The C2NET data base includes 15 data fields. A description of the data fields can be found in the *Final Report, Command and Control Functional Area Model (C2FAM) Data Study.*

c. The tasks explicitly modeled represent the processing of target nominations from sensor through target attack; the processing of intelligence (spot) reports; processing requests for support; processing critical situation reports; and the development and processing of FRAGOs for maneuver units. The model was designed to measure processing times for each of these functions. Figure 4-1 illustrates both the architecture of the model and the vertical and horizontal flow of information for processing targets from corps-managed sensors

N-2. Doctrinal model. Data for the doctrinal base case was used from the existing C2NET model.

N-3. DOCC (V Corps) model. Data for the long-term planning process and all except four execution tasks for the V Corps alternative was used from the C2NET model.

a. Data for developing aviation CONPLANs and supporting SEAD fire plans and executing deep attack missions was collected at the V Corps CARAVAN GUARD CPX conducted during July 1994. ADOCS (appendix L) automatically collected this data.

b. The V Corps data collected by ADOCS was processed in a computer program called BestFit that compared the data points with 18 common distributions and ranked these distribution according to how well each distribution fit a set of data points. BestFit then provided the parameters of each distribution. Time duration data with corresponding distributions for the four C2 tasks are described bellow.

(1) *Process target attack* (DOC): Exponential distribution with mean = 6.25.

(2) *Coordinate target attack* (Corps Arty G3): Gamma distribution with Alpha = 2.47 and Lambda = 2.98.

(3) *Ident & resolve airspace conflicts* (A2C2): Exponential distribution with mean = 17.22.

(4) *Transmit mission to unit* (DOC): Exponential distribution with mean = 2.26

APPENDIX O

RESEARCH/CARAVAN GUARD OBSERVATIONS

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APPENDIX O

RESEARCH/CARAVAN GUARD OBSERVATIONS

O-1. Introduction. Our research of many Army publications and corps field SOPs regarding deep operations during the July 1994 V Corps CARAVAN GUARD CPX led us to many observations. These observations were found outside the purview of the study. However, additional research and testing of the bellow observations could lead to further enhancements of corps deep operations C2 procedures.

O-2. Observations.

a. Research.

(1) The four deep operations C2 functions selected by D&SA BL are: plan, coordinate, synchronize, and execute (figure O-1). Our conclusion is that there are only two principal functions, plan and execute (even though the study was completed by using the four identified by D&SA BL). To successfully develop an OPLAN and execute its corresponding OPORD requires continuous and ongoing coordination and synchronization. Coordination may be thought of as planning or executing vertically within a battlefield functional area (BFA) and synchronization may be thought of as planning or executing horizontally across BFAs to leverage separate capabilities, gaining effects through the synergy of applying multiple BFA capabilities simultaneously.

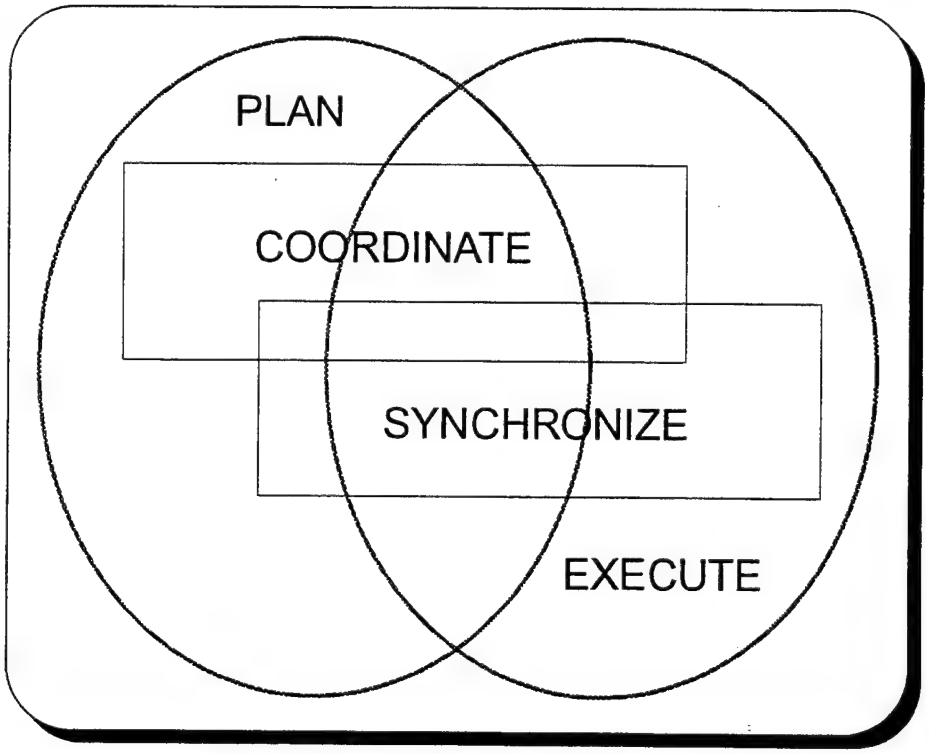

Figure O-1. Deep operations C2 functions

(a) Figure O-1 illustrates how the two major functions (plan and execute) are supported by coordination and synchronization; none of the tasks are separate from each other and the overlap between plan and execute. During planning for a future operation, the staff is executing the current operation, and during execution, there is planning for future operations and evaluation of current operations.

(b) There is overlap between coordination and synchronization. In fact, it is often difficult to distinguish between these. Coordination begins immediately upon receipt of a mission and consists of actions taken to ensure that future operations (determined during planning) can be supported and current operations (determined during execution) are supportable. Synchronization is the concurrence of events or motion in respect to time (having their beginning at different times, but their endings at the same time) and the ability to focus resources and activities in time and space to produce maximum relative combat power at a decisive point.

(c) *Synchronization usually requires explicit coordination among the various units and activities participating in any operation. By itself, however, such coordination is no guarantee of synchronization unless commanders first visualize the consequences to be produced and how they sequence activities to produce them. Staffs must understand their commander's intent since they must make a large part of the synchronization plan happen. Synchronization thus takes place first in the minds of commanders and then in the actual planning and coordination of movements, fires, and supporting activities.* Synchronization occurs during planning (envisioning how to bring combat/combat support/combat service support in the close/deep/rear battles at the time and place of the commander's choosing to promote the greatest success of his units at the least cost and to delay/disrupt/destroy the enemy the most) and execution (by maintaining agility to react to enemy actions in such a way to bring multiple combat assets against enemy successes/failures).

(2) FSCL. This fire support coordination measure is used strikingly different by III and V Corps.

(a) III Corps uses the FSCL (about 100-150 kilometers forward of the FLOT) doctrinally to coordinate fires of air, ground, and sea weapon systems using all type of ammunition against surface targets. The corps deep area of operations extends from the battlefield coordination line (BCL) (a III Corps-unique coordination measure, about 25 kilometers forward of the FLOT) to the FSCL. This area establishes the division between the corps and its major subordinate commands (MSC) for deep operations, intelligence, and fires. MSCs must coordinate with III Corps before conducting cross-FLOT operations forward of the BCL or delivering fires beyond the BCL. The corps must coordinate with MSCs if deep operations or fires are to be delivered short of the BCL.

(b) V Corps uses the FSCL (about 25 kilometers forward of the FLOT, about the same distance as the III Corps BCL) as a restrictive rather than permissive measures in that all fires beyond the FSCL must be coordinated through the DOC. The corps' deep area of operations extends from the FSCL to the army group reconnaissance interdiction planning line (reconnaissance interdiction planning line (RIPL), a NATO-only term), about 80-100 kilometers

forward of the FLOT (about the same distance as the III Corps/doctrinal FSCL). This discrepancy in use of terms could be difficult for these units to function together. Additionally, it would be difficult for the corps to function as a joint task force with the Navy or allied forces.

(3) Decide-detect-*track*-deliver-*assess* targeting methodology.

(a) Research and direct observations have revealed that the acronym for targeting must evolve to include *track* and *assess*. *Tracking* is required to provide the "final read" to make a "GO/NO GO" decision to launch an Apache cross-FLOT deep attack. Further, this critical subfunction of *detect* takes on special importance when focusing on short dwell, high-payoff targets which must be attacked rapidly. It is during this subfunction that the staff must clearly understand the commander's intent for fires relative to the deep fight. Many times units do the *detect* function well, but as time passes, the targets are lost and the enemy pops up where he is not expected. The ability to track the enemy as it advances through the area of interest into the desired engagement area is key to *deciding* to release scarce attack assets.

(b) *Assess* is a key subfunction of the "deliver" function of the targeting methodology. Once the attack has been carried out in accordance with the published attack criteria, target damage assessment (TDA) must be obtained and passed quickly to assess whether the desired damage was achieved. If not, key attack assets must be recycled, intelligence and attack plans must be updated, and re-attack initiated while the opportunity is present. Obviously, the ability to *track* is still key to success. The ability to quickly assess the results of a deep attack, decide to re-execute the current CONPLAN, or develop a new one, is crucial to the overall success of deep attack operations in the corps.

(4) The draft EAC and Corps Deep Operations Handbook (TTP) calls for the plans cell to identify deep targets through the IPB process that should be attacked to support the close operation. The plans cell initiates the coordination with intelligence assets to begin employing sensors to detect high-value and high-payoff targets. Once the deep targets required to support future operations are identified (*decide*) and detection (*detect*) assets have been allocated and employed, the plans cell must transition the responsibility for the monitoring of sensors and execution of the deep attack operations. Observations of field units demonstrated that a DOC is more appropriate for identification of targets. The DOC needs an articulated commander's intent for deep attack operations from the plans cell. With this intent and interactions with the corps G2 targeting cell, corps artillery target analysts, field artillery staff, corps aviation brigade staff, and ALO/ASOC, suitable targets for the intent can be developed in a more timely manner. Moving the *decide* tasks into the DOC ensures continuity of the targeting effort and keeps the executors in charge of the process.

(5) Simultaneous attack in depth accelerates an enemy's disorganization, disintegration, and, finally, his destruction. The corps must attack throughout the depth of the battlefield, fighting deep while simultaneously conducting decisive close operations. Today's technology allows the commander to "see the battlefield" better and make timed critical decisions effectively. Successful simultaneous attacks in depth require the efforts of several people and agencies within the corps and a sharing of critical information. In addition, unity of effort demands a single staff agency

[DOCC?] be responsible for ensuring that all assets are employed according to the corps commander's guidance and intent. Successful deep operations erode the enemy's ability to hold our centers of gravity and critical functions at risk.

(6) The following are miscellaneous comments from FM 100-15, *Corps Operations.*

(a) Increasing the range at which we detect, acquire, identify, engage, and destroy the enemy allows us to achieve distinct advantages.

(b) Achieving the full potential of depth and simultaneous attack requires synchronized and integrated command and control.

(c) Enhanced automation significantly improves the assimilation, production, and distribution times of key information (intelligence, technical FS, and C2). Automated systems provide the near-real time connectivity from "sensor-to-shooter" required to effectively and safely conduct simultaneous attacks in depth. The results of this process (prioritized multidimensional attack missions at decisive points and critical times on the battlefield) are translated into controlling the enemy's tempo and sustaining the initiative.

b. III Corps SOP/CPX (June 1994 BCTP).

(1) The corps' G3 Plans projected out 72 hours based on mission received from EAC. The corps G3 Plans conducted mission analysis, especially requirements for long-range strike packages; analyzed present mission and looked at enemy and friendly combat power; deduced correlation of forces, time, and space; and evaluated where both sides were and where both sides should be at critical times and places. They developed a scheme of maneuver and coordinated with higher headquarters. Then they wargamed a series of COAs to develop tasks for deep operations for today, tomorrow, and 72 hours -- looking at what the keys to success are and what things can be influenced/shaped. This entire process required 12 to 24 hours daily to include staffing and coordination.

(2) The G2 Plans worked with the G3 Plans to develop the enemy situation/COAs. G2 Plans integrated the ACE input and was the spokesperson for the ACE/intelligence for the planning process (G2 Plans pulled intelligence into plans and provided the ACE focus of future operations). They drafted priority intelligence requirements (PIR)/intelligence requirement (IR) for contingency plan options, coordinated with ACE, and assisted G3 Plans with correlation of forces. Multiple contingency plans were drafted to cover different enemy reactions.

(3) The corps' G3 deep planner, in the deep operations planning cell of the FSC, drafted deep operations plans to accomplish the objectives based on the overall plan and deep operations tasks developed by G3 Plans. The aviation brigade was the primary executor of deep operations. ATACMS was used on high-payoff targets and in a SEAD role.

(4) The ACE targets officer was the integrator of deep operations plans for ACE (in conjunction with G2 Plans); the focus was on targets that needed to be identified/struck for deep

operations. He was spokesperson for ACE/intelligence at deep operations meetings, collected data on the enemy situation for deep operations meetings, and provided corporate G2 assessment to staff working deep operations.

c. V Corps SOP/CPX.

(1) V Corps has the plans cell identifying the projected flow of battle, the desired COA and a corresponding concept of operations, and the commander's intent. The DOC identifies targets and effects coordination with intelligence assets to begin employing sensors to detect high-payoff/priority targets. The DOC maintains constant coordination with the current operations and plans cells to ensure that the current operations mission remains the same and there is no reason to adjust the deep operations mission to react to an unforeseen tactical development. If so, the DOC quickly reorients to the new mission and is able to develop, coordinate, and synchronize an attack plan in a matter of hours. The process allows for cross-queuing of sensors to verify and validate sensor readings and validate decide and attack criteria.

(2) Horizontal integration of deep operations planning and execution has been significantly enhanced by ADOCS (appendix L). Currently, the system allows receipt and review of electronic intelligence and order of battle intelligence from WARRIOR (the current intelligence automated system -- the precursor to ASAS), development and processing of targets and fire plans, input or receipt of target nominations and processing of requests for fires through TACFIRE, and receipt and transmission of operations information (reports and messages).

(a) Passing intelligence/sensor data could benefit from being more automated. Although the WARRIOR/ADOCS link is automated, there is no automated link from the WARRIOR compartmented enclave to ADOCS. A key to successful deep operations is distribution of intelligence data among automated systems without manual reentry. Deep operations targets are finite and preplanned; the data required from intelligence is not all-consuming nor unlimited. Target data, based on intelligence requirements specified by the corps artillery G3, could be passed from numerous intelligence processors into ADOCS by a man-in-the-loop in the intelligence cell, either by an FAIO or G2 targeter.

(b) ADOCS development has been extremely responsive to the user's needs and has been available when the user needs it. Compared to the development of the individual ATCCS systems, the current ADOCS has many more capabilities. The Army (Department of the Defense (DoD)) should assess the ADOCS development process and consider a hybrid process, using the good parts from the standard, formal development process and the ADOCS development process.

(3) The A2C2 element used grease pencils on overlays to plot Army attack aviation routes. This was very time-consuming and laborious. As the quantity of potential aviation CONPLANs exceeded three or four, the process became more difficult, tedious, and error-prone. A2C2 needs a larger screen monitor to be able to see details necessary to clear airspace. The necessary information is already in ADOCS data bases; this should be used rather than manually transferring to acetate overlays. Formal automation processing procedures must allow the screen to show

restricted operating zones (ROZ) around fire units and ATACMS targets and conflicts with planned Apache ingress and egress air routes.

(4) The ALO cleared air space in series ***after*** A2C2 had plotted and cleared Army aviation and artillery. The ALO needs an ADOCS terminal so they can perform their clearance function in parallel with A2C2 as they clear artillery and Army aviation. Greater integration of ASOC and A2C2 air space clearance functions is needed with A2C2 having final word for air space clearance.

(5) Corps attack helicopters were used for night attacks only. These weapons are too vulnerable to enemy ADA systems and small arms fires to fly across the FLOT in daylight. The corps aviation regiment has an ADOCS terminal to plan ingress and egress routes, overlay enemy air defense coverage, and plan SEAD. The aviation plan/order to subordinate battalions is not prepared on ADOCS. The capability to develop aviation plans and orders is being considered for addition to the Maneuver Control System (MCS) or the aviation mission planning system (AMPS). This capability should be added to ADOCS as soon as possible. The capability should be included in future versions of MCS and AMPS, ensuring continuity of screen and operator interface.

(6) ATACMS was used in advance of helicopter to provide SEAD as they ingressed from the FLOT to the engagement area(s).

(7) *Tracking.* Tracking enemy deep maneuver and fire support forces entering the corps' area of influence (between the FSCL and RIPL) was exceptionally critical and important as night approached. The location of enemy forces was required to plan and execute Apache night attacks. If the track of enemy locations was inadequate, the planned helicopter attack(s) had to be aborted. This resulted in failure to use all available assets in the corps plan.

d. Comparison of III and V Corps.

(1) Similarities.

(a) Corps commanders have given the responsibility and authority to conduct deep operations to their respective corps artillery commanders. The corps' artillery commanders have formed DOCs to perform deep operations C2 procedures. They have established regularly scheduled meetings to make missions "normal" operations rather than special opportunities. They fight the deep battle continuously. Both corps have designated specific personnel other than G3 plans to handle deep battle missions.

(b) The key driver of all corps operations is the corps commander's intent and what he wants accomplished. This is captured in bullet form and is the basis of the OPLAN developed by G3 planners.

(c) They both use Apaches as principal deep attack weapon system and employ them primarily between EENT and BMNT.

(d) They both use ATACMS primarily on high- priority targets and for SEAD to protect employment of Apaches.

(e) During the evening prior to Apache deep attacks, they assemble a select group of staff personnel in the FSC who conduct final coordination and synchronization. They track the enemy into proposed engagement areas, finalize SEAD plans, and monitor the attack in progress.

(f) The corps artillery G2s are users of finished intelligence from the corps' intelligence cell. The corps artillery G2s do not develop targets from sensors; instead, they pass finished intelligence to the DOC and artillery community. Corps artillery G2s contribute to development of both the situation and event templates.

(2) Differences.

(a) In III Corps, the FSE planner works in the FSC, whereas in V Corps, the FSE planner works in the corps' plans cell closely with the G2 and G3 planners. The V Corps FSE planner develops the FS task organization and fire support annex. As part of the corps' plan, the deep operations mission is developed and passed to corps artillery.

(b) The V Corps artillery commander serves as the deep battle captain, whereas the III Corps aviation officer is responsible for supervising planning, coordinating, and executing Army aviation operations in support of corps deep operations.

(c) ATO cycles begin and end at different times. If they were deployed in the same theater, one (or both) would have to adjust to the EAC ATO cycle time.

e. Comparisons of III/V Corps to doctrine.

(1) Similarities.

(a) Both corps ensure that deep attack plans are developed based on corps commander's intent and corps plans cell assessment of threats to corps area of operations.

(b) Both corps use the doctrinal combat decision making process (as described in CGSC Student Text 100-9) to develop deep attack CONPLANs.

(c) Both corps operate at TO&E manning levels. Neither has depleted any staff section to augment their DOCs.

(2) Differences. Both corps have recognized that current doctrine limited their ability to fully exploit recent advances in acquisition and attack assets. Accordingly, they have both reorganized their main CP to focus on continuous planning and execution to deep attack operations. Specific changes/modifications to current doctrine are listed below.

(a) Both corps established a formal deep operations chain of authority. The corps artillery commander has responsibility to plan, coordinate, and synchronize the execution of all fire support assets in the deep attack plan. The FSCs are complemented with aviation brigade staff for specific aviation routing and SEAD planning. The corps' aviation brigade commander still retains command authority for commitment of their assets in accordance with the corps plan.

(b) Both corps have established a structure of daily planning and coordinating meetings in the FSC to ensure deep attack plans are synchronized with the corps collection plan and future corps operations.

(c) Both corps have integrated corps targeting cell procedures into deep attack operations. Initial moving target indicators ("early read") are regularly available within the DOCs, as are the results of continual tracking by targeting units into engagement areas. Finally, immediate access to TDA allows for timely assessment of results achieved in deep attack operations. If re-attack is necessary, the deep attack chain of authority are able to quickly modify attack plans and execute.

O-3. Conclusions.

a. Research.

(1) The two major deep operations C2 functions can be mapped to the targeting methodology of *decide-detect-deliver.* Plan maps to *decide* and execute maps to *detect-deliver.*

(2) III and V Corps use similar fire coordination measures about the same distance forward of the FLOT. But they use the same name (fire support coordination line (FSCL)) for opposite ends of their deep operations areas (figure O-2). III Corps uses the FSCL permissively for the deep end (at 100-150 kilometers from the FLOT) and V Corps uses the FSCL restrictively for the close end (at 25-30 kilometers from the FLOT). Were these two organizations to fight side-by-side, there could be severe confusion.

(3) Tracking enemy units as they enter the corps deep area is extremely important. Commitment of limited weapons systems such as ATACMS missiles and Apaches require firm knowledge of enemy unit identification and location. Without accurate and current information of enemy unit identification and location, the corps will not engage these targets. It is also extremely important to assess the damage caused by our attacks. This information will drive future deep and close OPLANs.

b. DOCC. Corps in the field have recognized the need to centralize the responsibility to plan and execute deep operations with the corps artillery commander. The artillery commander has a large enough staff to perform these C2 procedures and either directly or indirectly controls all lethal and non-lethal systems used to attack deep targets. V Corps is jointly developing an automated system to assist with the horizontal integration of the deep operations planning and execution processes. The ADOCS system is being adopted by the other corps to provide the same assistance to their deep operations procedures. Observations during the July 1994 V Corps CARAVAN GUARD revealed the following.

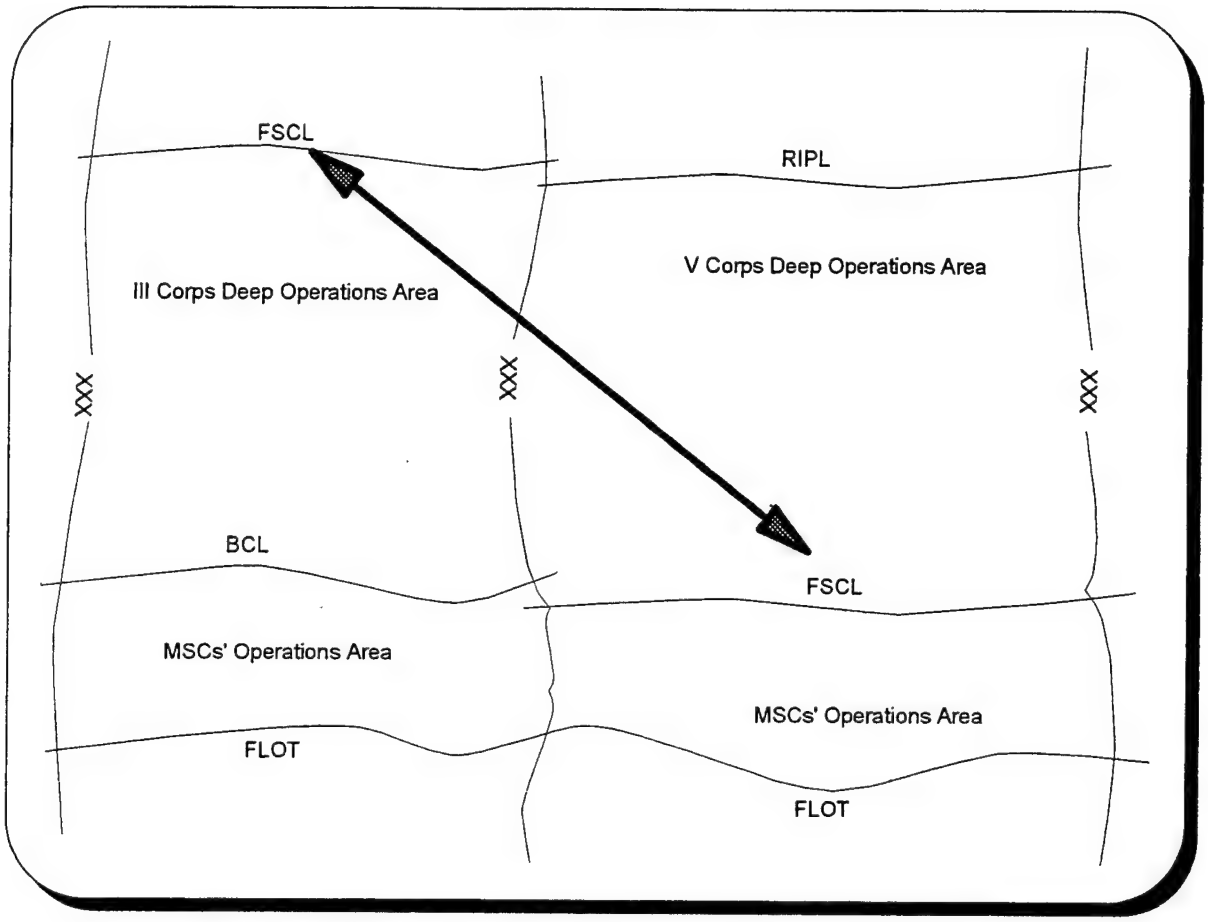

Figure O-2. Corps fire support coordination measures

(1) DOC can handle the responsibility for monitoring sensors and executing deep operations attacks upon receipt of the deep operations focus from the G3 plans via the commander's intent.

(b) V Corps SOP/CARAVAN GUARD. There needs to be a greater integration between the A2C2 element and the ASOC for clearing air space for deep attack missions. The clearance process would be even more difficult if naval aviation and gun fire were to be involved.

(c) The ASOC is not linked into ADOCS. The Air Force executes BAI missions throughout the ATO cycle.

O-4. Recommendations.

a. Additional work should be done to refine A2C2 procedures to clear ATACMS missions. Methods should be explored to integrate automated systems in the ASOC with the ADOCS to ultimately create one element to truly coordinate and control the corps airspace.

b. Develop automated graphical decision aid tools to support the wargaming process. Ultimately, the capability should allow several different COAs and CONPLANs, with appropriate force structures, to be entered. Additionally, the display should access existing target data bases

and allow the input of routes and axes of advance. Finally, the tool should have a rough force-on-force simulation model to quantify the expected results of the various COAs.

c. Develop methods to integrate ADOCS display and graphics capabilities with the Advanced Technologies "corps command post" system. Currently, the "corps command post" system has the capability to bring a staff section to the commander whenever the need exists regardless of where he is on the battlefield. However, the system is limited to video-teleconferencing (VTC)-type displays of still maps and graphics. To optimize capability, the need exists to integrate the planned graphics and routes with the digitized terrain of the corps command post system and allow the commander to interact with the display and modify routes, axis of advance, and engagement areas in accordance with his intent.

APPENDIX P

GLOSSARY

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APPENDIX P

GLOSSARY

A2C2	Army airspace command and control
ABCS	Army Battle Command System
ACE	analysis and control element
ADA	air defense artillery
ADE	air defense element
ADOCS	Automated Deep Operations Coordination System
AFIO	Air Force intelligence officer
AFSCOORD	assistant fire support coordinator
AI	Air (Force) interdiction
AIRCENT	Allied Air Forces Central Europe
ANGLICO	Air-Naval gunfire liaison company
ALO	Air (Force) liaison officer
AMPS	aviation mission planning system
AOR	area of responsibility
ARPA	Advanced Research Projects Agency
ARTEP	Army training evaluation program
ASAS	All source analysis system
ASOC	Air (Force) support operations center
ASPB	all source production branch
ASPS	all source production section
ASSESSREP	assessment report
ATACMS	Army tactical missile system
ATCCS	Army tactical command and control system
ATGM	attack guidance matrix
ATKHB	attack helicopter battalion
ATO	air tasking order
BAI	battlefield air interdiction
BCE	battle(field) control element
BCL	battlefield coordination line
BCTP	battle command training program
BFA	battlefield functional area
BL	battle lab(oratory)
BMNT	before morning nautical twilight
BOS	battlefield operating system
C2	command and control
C2NET	Command and Control Network (model)
C3CM	command, control, and communications countermeasures
C4I	command, control, communications, computers, and intelligence

CA	corps artillery
CAB	corps aviation brigade
CAC-CD	U.S. Army Combined Arms Center - Combat Developments
CCIR	commander's critical information requirement(s)
CDP	combat decisionmaking process
CG	commanding general
CGSC	Command and General Staff College
CM&D	collection management and dissemination
Cml	chemical
COA	course of action
COC	current operations cell
COMLANDCENT	Commander, Land Forces Central Europe
CONPLAN	contingency plan
CoS	chief of staff
CP	command post
CPX	command post exercise
CSS	combat service support
CTAPS	Contingency TACS Automated Planning System
CTOCSE	corps tactical operations center support element
D&SA BL	Depth and Simultaneous Attack Battle Lab(oratory)
DCO	deputy commanding officer
DDP	deliberate decisionmaking process
Dec Elem	deception element
DFC	deep fires coordinator
DFCOORD	deep fires coordinator
DOC	deep operations cell/center
DOCC	deep operations coordination cell
DOCOORD	deep operations coordinator
DoD	Department of Defense
DOEC	deep operations execution cell
DOTC	deep operations targeting cell
DST	decision support template
EA	engagement area
EAC	echelons above corps
EEA	essential elements of analysis
EENT	early evening nautical twilight
ELINT	electronic intelligence
EN	engineer
ENCOA	enemy course of action
EW	electronic warfare
FA	field artillery
FAIO	field artillery intelligence officer

FLOT	forward line-of-own-troops
FM	field manual
FRAGO	fragmentary order
FS	fire support
FSC	fire support cell
FSCM	fire support coordination measure
FSCOORD	fire support coordinator
FSE	fire support element
FSCL	fire support coordination line
HPT	high-payoff target
HPTL	high-payoff target list
HUMINT	human intelligence
HVT	high-value target
HVTL	high-value target list
IAW	in accordance with
ICAOC	interim combined air operations center
ICW	in conjunction with
IEW	intelligence and electronic warfare
IPB	intelligence preparation of the battlefield
IR	intelligence requirement
JAAT	joint air attack team
JAART	joint attack of artillery
J-SEAD	joint suppression of enemy air defense
LAN	local area network
LANDCENT	Land Forces Central Europe
LCC	land component commander
LNO	liaison officer
LRSU	long-range surveillance unit
MCS	Maneuver Control System
MICOM	U.S. Army Missile and Intelligence Command
MLRS	multiple-launch rocket system
MOP	measures of performance
MSC	major subordinate command
MSE	multiple subscriber equipment
NAI	named area of interest
NCO	non-commissioned officer
OAS	offensive air support
OIC	officer in charge

OPFAC	operations facility
OPLAN	operations plan
OPORD	operations order
ORSA	operations research and systems analysis
PAO	public affairs officer
PC	personal computer
PIR	priority intelligence requirements
PSYOPS	psychological operations
RIPL	reconnaissance interdiction planning line
ROZ	restricted operating zone
SAC	Study and Analysis Center
SEAD	suppression of enemy air defense
SIGO	signal officer
SITREP	situation report
SJA	staff judge advocate
SOCCE	special operations center control element
SOCOORD	special operations coordinator
SOF	special operations forces
SOP	standing operating procedure
STAPN	stochastic, timed, attributed Petri nets
STACCS	Standard Army Command and Control System
SWO	staff weather office
TAC	tactical
TACAIR	tactical (a)Air (Force)
TACFIRE	tactical fire direction
TACP	tactical air control party
TACS	tactical air control system
TAI	target area of interest
TDA	target damage assessment
TM	theater missile
TMD	theater missile defense
TO	targeting officer
TR	technical report
TRAC	TRADOC Analysis Center
TRADOC	U.S. Army Training and Doctrine Command
TTP	tactics, techniques, and procedures
TSS	target selection standard
VTC	video-teleconference

APPENDIX Q

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APPENDIX Q

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